Vol. 1067 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 3, 1986

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 3, 1986 Volume 1067 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Mar. 31, 1986.

Board of Appeals Decisions Rendered in the Month of Apr. 1986

Affirmed	175
Affirmed in Part	41
Reversed	76
Total	292

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 31, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,385,403 through 4,386,436
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 16, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,319,420	06/223,250	3/16/82
4,319,645	06/217,533	3/16/82
4,319,713	06/222,569	3/16/82
4,319,952	06/220,761	3/16/82
4,319,985	06/218,977	3/16/82
4,320,042	06/217,449	3/16/82
4,320,058	06/220,471	3/16/82
4,320,086	06/222,636	3/16/82
4,320,123	06/220,941	3/16/82
4,320,144	06/250,469	3/16/82
4,320,183	06/232,576	3/16/82
4,320,271	06/237,337	3/16/82
4,320,377	06/248,993	3/16/82
4,320,404	06/237,642	3/16/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,767,706, Re. S.N. 815,263, Filed Sept. 23, 1985, Cl. 260/029.70B, HYDRATION OF ALIPHATIC NITRILES TO AMIDES USING COPPER METAL CATALYSTS, Clarence E. Habermann, et al., Owner of Record: *Inventor,* Attorney or Agent: Charles J. Enright, Ex. Gp.: 112

4,319,579, Re. S.N. 786,710, Filed Oct. 11, 1985, Cl. 128/640, REUSABLE MEDICAL ELECTRODE HAVING DISPOSABLE ELECTROLYTE CARRIER, James V. Cartmell, Owner of Record: *NDM Corp., Dayton, Ohio,* Attorney or Agent: H. Talman Dybvig, Ex. Gp.: 335

4,323,127, Re. S.N. 728,187, Filed Apr. 29, 1985, Cl. 173/053, ELECTRICALLY OPERATED IMPACT TOOL, James D. Cunningham, Owner of Record: *Inventor,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 247

4,381,783, Re. S.N. 729,678, Filed May 2, 1985, Cl. 604/368, ABSORBENT ARTICLE, Robert T. Elias, Owner of Record: *Johnson & Johnson, New Brunswick, N.J.,* Attorney or Agent: Leonard P. Prusak, et al., Ex. Gp.: 336

4,435,688, Re. S.N. 837,040, Filed Mar. 6, 1986, Cl. 331/99, FET MICROWAVE OSCILLATOR BEING FREQUENCY STABILIZED BY CAPACITIVE REACTANCE MICROSTRIP STUB LINE, Keiro Shinkawa, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 252

4,437,478, Re. S.N. 841,601, Filed Mar. 20, 1986, Cl. 133/5R, COIN COUNTING AND DISPENSING APPARATUS, Hiroshi Abe, Owner of Record: *Asahi Seiko Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Roger W. Parkhurst, et al., Ex. Gp.: 311

4,491,775, Re. S.N. 828,613, Filed Feb. 12, 1986, Cl. 318/434, MOTOR OPERATING PARAMETER SENSING APPARATUS, Raymond G. A. Harvey, et al., Owner of Record: *Colin Frank Norton, Andover, England,* Attorney or Agent: Lawrence E. Laubscher, Sr., et al., Ex. Gp.: 217

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name: "CHRISTIAN KIM, INC."

Action: Notice of Application for Recordaiton of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CHRISTIAN KIM, INC." used by Christian Kim, Inc., a corporation organized under the laws of the State of Calif., located at 124 E. Olympic Blvd., Los Angeles, Calif. 90015.

The application states that the trade name is used in connection with footwear, manufactured in Korea.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before June 27, 1986.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

STEVEN I. PINTER,
Acting Director, Entry Procedures and Penalties Division.

Apr. 24, 1986.

Trademark Law Office Changes in Examination of Classes

To evenly distribute the examination of applications filed among the Law Offices, the following International Classes are now being examined by the following Law Offices:

Class	*Law Office No.*
13	1
20	2
34	2
2	3
10	7
12	8
21	8

These changes will be incorporated into the listing of classes assigned to each Law Office in the Trademark Examining Operation which appears immediately after the Patent and Trademark notices in each Official Gazette.

Any questions concerning these classes generally or concerning applications filed in these classes should be directed to the listed Law Office.

MARGARET M. LAURENCE,
May 5, 1986. *Assistant Commissioner for Trademarks.*

Viewing of Video Tapes During Interviews

The Patent and Trademark Office has video tape equipment available in the facilities of the Patent Academy for viewing video tapes from applicants during interviews with patent examiners.

The video tape equipment may use VHS and UHS (¾ inch tape) cassettes.

Attorneys or applicants wishing to show a video tape during an examiner interview must be able to demonstrate that the content of the video tape has a bearing on an outstanding issue in the application and its viewing will advance the prosecution of the application. Prior approval of viewing of a video tape during an interview must be granted by the SPE. Also, use of the room and equipment must be granted by the Training Manager to avoid any conflict with the Patent Academy.

Requests to use video tape viewing equipment for an interview should be made at least one week in advance to allow the Patent Academy staff sufficient time to ensure the availability and proper scheduling of both a room and equipment.

Interviews using Office video tape equipment will be held only in the Academy facilities located in One Crystal Park, Rm. 502. Attorneys or applicants should not contact the Patent Academy directly regarding availability and scheduling of video equipment. All scheduling of rooms and equipment should be done through and by the examiner conducting the interview.

RENE D. TEGTMEYER,
May 6, 1986. *Assistant Commissioner for Patents.*

Errata

The Withdrawal Notice regarding Patent Number 4,496,395 appearing at 1051 O.G. 23, on Feb. 26, 1985 was published in error.

Patent Number 4,496,395, dated Jan. 29, 1985, to John J. Croat of Mich. for HIGH COERCIVITY RARE EARTH-IRON MAGNETS was granted.

PATENT NOTICES

Certificates of Correction for the Week of June 3, 1986

Re. 32,040	4,533,127	4,547,377	4,566,745
Re. 32,077	4,533,446	4,548,772	4,566,867
D. 281,492	4,533,808	4,549,311	4,567,229
D. 281,586	4,534,400	4,550,024	4,567,284
D. 282,460	4,534,674	4,550,548	4,567,720
4,268,771	4,535,009	4,551,849	4,567,906
4,308,084	4,535,169	4,551,895	4,568,098
4,316,872	4,535,230	4,552,633	4,568,919
4,330,298	4,535,927	4,552,825	4,569,020
4,379,572	4,536,402	4,554,090	4,569,189
4,392,326	4,538,002	4,554,116	4,569,367
4,445,901	4,538,158	4,554,500	4,569,857
4,450,721	4,539,095	4,555,024	4,569,922
4,464,725	4,539,345	4,555,779	4,570,047
4,471,305	4,539,526	4,556,166	4,570,288
4,476,481	4,539,552	4,556,750	4,570,381
4,476,873	4,539,950	4,556,823	4,570,488
4,477,363	4,540,078	4,557,089	4,571,510
4,480,280	4,540,598	4,557,650	4,571,617
4,502,896	4,540,621	4,558,075	4,571,816
4,503,474	4,540,790	4,558,182	4,571,934
4,505,310	4,541,361	4,558,897	4,572,287
4,506,010	4,541,490	4,558,930	4,572,449
4,506,716	4,542,043	4,559,267	4,572,841
4,508,614	4,542,078	4,560,563	4,573,002
4,510,827	4,542,238	4,561,510	4,573,130
4,511,434	4,542,633	4,562,058	4,573,342
4,512,087	4,542,693	4,562,857	4,574,187
4,514,215	4,542,913	4,562,895	4,575,545
4,517,714	4,543,039	4,563,392	4,577,271
4,519,757	4,544,593	4,564,335	4,577,416
4,525,324	4,545,813	4,564,396	4,577,587
4,526,580	4,545,911	4,565,334	4,577,699
4,532,272	4,545,915	4,565,819	
4,532,627	4,547,301	4,566,440	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2432
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 26, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	3-11-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	7-23-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-17-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-01-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during April 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,435,460 to 3,441,959, inclusive

Plant Patents ..... Numbers 2,876 to 2,881 inclusive

STATUTORY INVENTION REGISTRATIONS

PUBLISHED JUNE 3, 1986

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H69
SOLVENT TREATMENT OF COAL FOR IMPROVED LIQUEFACTION

Herbert R. Appell, Pitcairn; Nand K. Narain, Bethel Park, and Bruce R. Utz, Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 587,422, Mar. 8, 1984. This application Nov. 6, 1985, Ser. No. 795,302

Int. Cl.[4] C10G *1/00;* **C10B** *49/02, 53/04*

U.S Cl. 208—418 **5 Claims**

1. In a solvation method for the liquefaction of carbonaceous material wherein the material is contacted with a hydrocarbonaceous liquid solvent in the presence of a source of hydrogen gas in a single liquefaction stage at a liquefaction temperature of at least 350° C. for a period of about 5 to 30 minutes, and a portion of the liquefaction product from the liquefaction stage is recycled for use as at least a portion of the liquid solvent, the improvement comprising: pretreating said carbonaceous material in contact with the hydrocarbonaceous liquid solvent in a preheater stage at a temperature of at least about 200° C. but not more than about 350° C. for a period of ten minutes to four hours to allow swelling of the carbonaceous material and penetration of the pore structure of the carbonaceous material with the hydrocarbonaceous liquid solvent prior to application of hydrogen gas and exposure to temperatures in excess of 350° C. in the presence of the hydrocarbonaceous liquid solvent in the liquefaction stage, said solvent is selected from the group consisting of hydrogenated creosote oil, SRC-II heavy distillate, 1-methylnaphthalene, and quinoline.

H70
METHOD FOR PRODUCING NUTRITIONALLY DENSE FREEZE DRIED FOOD BARS

Daniel Berkowitz, Wellesley; Gary W. Shults, Upton, and Agnes G. Russell, Framingham, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1984, Ser. No. 600,241

Int. Cl.[4] A23C *1/06*

U.S. Cl. 426—385 **10 Claims**

1. A method of producing a nutritionally dense freeze dried food bar comprising:

a. preparing a mixture of uncooked food ingredients of said bar,

b. cooking and partially drying said mixture of uncooked food ingredients until about 40% to about 60% of the water content is removed by evaporation,

c. forming the mixture into food bars,

d. freezing said food bars,

e. dehydrating said food bars to a moisture content which will produce a shelf-stable product, and

f. packaging said food bars in a moisture and gas impermeable container.

H71
APPARATUS AND METHOD FOR INDICATION OF IONTOPHORETIC DRUG DISPENSER OPERABILITY

Paul D. Sorenson, Blaine, and Gary A. Lattin, Forest Lake, both of, MN, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 3, 1984, Ser. No. 637,643

Int. Cl.[4] A61N *1/30*

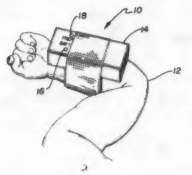
U.S. Cl. 604—20 **4 Claims**

1. A medical device for making iontophoretic contact with skin of a patient comprising:

a first visual indicator having a first controlled indication level;

means for making iontophoretic contact with skin of a patient;

means for measuring current flow across the impedance of the patient's skin;



a second visual indicator;

means for activating the second visual indicator to a indication level indicative of current flow across the impedance of the patient's skin, so that the indication level may be visually compared to the first indication level.

H72
ORGANIC SUBSTITUTES FOR CHARCOAL IN BLACK POWDER

Sean Wise, and Ronald A. Sasse, both of Abingdon, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 23, 1984, Ser. No. 573,097

Int. Cl.[4] C06B *31/02*

U.S. Cl. 149—61 **2 Claims**

1. In a solid pyrotechnic composition containing:

A. about 75 weight percent potassium nitrate,

B. about 10 weight percent elemental sulfur, the improvement consisting essentially of:

C. about 15 weight percent of an organic crystalline compound selected from the group consisting of:

1. fluorescein,
2. phenolphthalein,
3. 1,5 naphthalenediol,
4. anthraflavic acid,
5. terephthalic acid,
6. phenolphthalin,
7. the alkali metal salts of 1 to 6, and
8. mixtures of 1 to 6.

H73
INTEGRATED CIRCUIT PACKAGES

Kenneth K. Claasen, Lower Nazareth Township, Northampton County; Ronald N. Graver; Frank P. Pelletier, both of Allentown; Kurt M. Striny, Emmaus, and Ronald J. Wozniak, Allentown, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 25, 1983, Ser. No. 526,413

Int. Cl.[4] H01L *23/28*

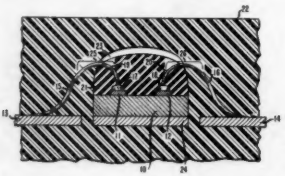
U.S. Cl. 357—72 **7 Claims**

1. A semiconductor device comprising:

a semiconductor chip electrically interconnected to metal leads by means of wires ball bonded to pads on a surface of the chip and extending from the pads to the leads, said wires including arched portions of a varying slope;

a thick protective layer formed over and limited to said surface of the chip and including areas over the pads, said

layer formed to a thickness which covers at least a part of the arched portions where the slope of the wires is reduced to less than 45° relative to the chip surface, but does not cover the entire length of the wires, said layer com-



prising a material having a large expansion coefficient and low shear modulus; and

a plastic encapsulating material surrounding said chip, protective layer, a portion of said leads, and covering a portion of said wires.

H74

PROCESS FOR THE PRODUCTION OF 18F-2-DEOXY-2-FLUORO-D-GLUCOSE

Chyng-Yann Shiue, East Setauket, N.Y.; Piero A. Salvadori, Pisa, Italy; Alfred P. Wolf, Setauket, N.Y.; Joanna S. Fowler, Bellport, N.Y., and Robert R. MacGregor, Sag Harbor, N.Y., assignors to The United States of America as represented by The United States Department of Energy

Filed Feb. 24, 1983, Ser. No. 469,597

Int. Cl.[4] C07H *1/00, 5/02, 5/00*

U.S. Cl. 536—124 **3 Claims**

1. A process for the production of ^{18}F-2-deoxy-2-fluoro-D-glucose in yields of about 20% based on total ^{18}F which comprises reacting ^{18}F-acetyl hypofluorite with 3,4,6-tri-O-acetyl-D-glucal and thereafter hydrolyzing the resulting tetraacetyl compound in dilute aqueous acid to remove the acetyl groups.

H75

NUCLEAR DIAGNOSTIC FOR FAST ALPHA PARTICLES

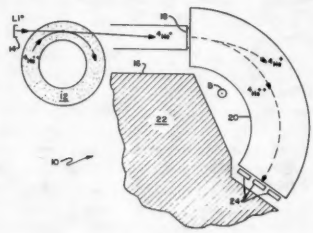
Larry R. Grisham, Lawrence Township, Mercer County; Douglass E. Post, Jr., Belle Mead, both of N.J., and John M. Dawson, Pacific Palisades, Calif., assignors to The United States of America as respresented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 554,851, Nov. 23, 1983, abandoned.

This application Dec. 30, 1985, Ser. No. 814,588

Int. Cl.[4] G21B *1/00;* G21G *1/10*

U.S. Cl. 376—143 **12 Claims**



1. In an energetic plasma confined by a high strength magnetic field wherein deuterium and tritium undergo fusion reactions in producing energetic alpha particles having a range of energies, a system for determining the numbere of said confined alpha particles having energies greater than a threshold energy level comprising:

a source of nuclei capable of undergoing a nuclear reaction with alpha particles having energies greater than said threshold energy level and of producing radioactive product nuclei having a measurable half-life, said nuclei having a low atomic number and a low thermal neutron collision cross-section;

connecting means for coupling said source of nuclei to said plasma and for directing said nuclei into said plasma in producing said nuclear reaction;

a probe positioned adjacent said plasma for collecting said radioactive product nuclei following said nuclear reaction; and

radiation sensitive means for measuring the radioactivity of said probe arising from the radioactive product nuclei collected by said probe, wherein said radioactivity represents the number of radioactive product nuclei in said probe, in determining the number of energetic alpha particles in the plasma having energies greater than said threshold energy level.

REISSUES

JUNE 3, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

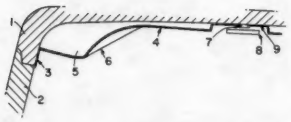
Re. 32,165
METHOD OF ASSEMBLING VEHICLE TOP STRUCTURE

Harold E. Gerring, Elkhart, Ind., assignor to Gerwin Vans, Inc., Bristol, Ind.

Original No. 4,358,883, dated Nov. 16, 1982, Ser. No. 103,586, Dec. 14, 1979. Application for reissue Nov. 16, 1984, Ser. No. 672,353

Int. Cl.[4] B21K *21/16;* **B23P** *17/04, 23/00*

U.S. Cl. 29—401.1 **13 Claims**



1. A method of converting a passenger compartment of a motor vehicle of the type bound by body side walls and a roof structure attached to the top of said side walls, comprising:

cutting through the side walls at a position below the roof structure and removing the roof structure and upper portion of the side walls as a unit from the vehicle passenger compartment,

forming a vehicle roof,

forming a relatively rigid self-supporting headliner separate from the vehicle roof, including means for accommodating vehicle lighting fixtures [and the like.]

attaching said self-supporting headliner to the top of the cut side walls of the vehicle,

attaching said vehicle roof on top of said headliner and to the top of the cut side walls of the vehicle to form a vehicle body top structure,

whereby assembly workers are allowed great freedom of movement and ease of access in assembling said headliner and said vehicle roof.

13. A method of converting a passenger compartment of a motor vehicle of the type bound by body side walls and a roof structure attached to the top of said side walls, comprising:

removing the existing roof structure at the top of said side walls from said vehicle passenger compartment;

forming a new vehicle roof part;

forming a relatively rigid self-supporting headliner, including means molded therein for receiving, structurally supporting and positively locating vehicle accessory component fixtures;

attaching said new vehicle roof part and said headliner to one another to form a relatively rigid unitary vehicle body top structure;

then affixing said vehicle accessory component fixtures to said relatively rigid unitary vehicle body top structure;

thereafter attaching said relatively rigid unitary vehicle body top structure as a preassembled unit with said accessory component fixtures therein to the vehicle to replace said existing vehicle roof structure previously removed; and

whereby assembly and conversion of said compartment can be made with minimal on-site modification and installation at the vehicle body itself.

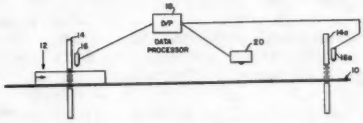
Re. 32,166
DETECTION OF FLAWS IN METAL MEMBERS

Arnulf Berge, Vågsbygd, Norway, assignor to Elkem A/s, Norway

Original No. 4,247,306, dated Jan. 27, 1981, Ser. No. 1,460, Jan. 17, 1979. Continuation of Ser. No. 386,440, Jun. 6, 1982, abandoned, which is a continuation of Ser. No. 957,343, Nov. 3, 1978, abandoned. Application for reissue Apr. 6, 1984, Ser. No. 597,207

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—322 **5 Claims**



2. A method for detecting flaws in a surface of a metallic workpiece selected from the group consisting of metal blooms and metal billets by means of an induction heater and a single infrared camera without coating said surface to increase the emission of heat therefrom which comprises:

(a) heating said metallic workpiece by moving said workpiece in one direction through said induction heater which generates a high frequency current that heats the workpiece;

(b) scanning said uncoated surface of said workpiece with said single infrared camera transversely across the surface of said moving workpiece immediately after induction heating and within not more than two seconds of the time of heating and recording a streaked pattern temperature profile in which the streaked pattern repeats itself where there are flaws in the surface of said metallic workpiece; and

(c) generating an output signal from said infrared camera corresponding to said recorded streaked pattern temperature profile to determine the location, size, shape and depth of flaws in the surface of said workpiece from said streaked pattern.

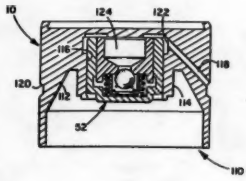
Re. 32,167
ACTING VALVE GEAR

Stephen M. Buente, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 4,367,701, dated Jan. 11, 1983, Ser. No. 100,690, Dec. 5, 1979. Application for reissue Jan. 11, 1985, Ser. No. 690,713

Int. Cl.[4] F01L *1/14, 1/24*

U.S. Cl. 123—90.55 **9 Claims**



9. A hydraulic lash adjusting tappet for use in the valve gear of an internal combustion engine, said tappet comprising:

(a) a member defining a cam face, said member formed of

material having a hardened surface adapted for contacting a cam;

(b) body means including structure defining:

(i) an outer annular wall having the outer periphery thereof forming a wear resistance surface;

(ii) at a web extending radially inwardly from said outer wall;

(iii) an annular hub disposed centrally within said outer wall and supported from said web, wherein said body means is formed of material selected from the group consisting of aluminum, material having a thermal expansion coefficient not less than 22×10^{-6} per unit length per degree centigrade as measured in the range 20–100 C., or material having a bulk modulus not greater than 2.85 grams per cubic centimeter

(c) hydraulic lash adjusting means movably received in the open end of said hub, said lash adjusting means including structure defining a reaction surface adapted for contracting associated components of the engine valve gear, said reaction surface extending generally parallel to said cam face and being movable with respect thereto, said lash adjusting means including means defining a fluid pressure chamber and one-way valve means operable to admit fluid to said chamber for altering the position of said reaction surface with respect to said cam face for lash adjustment in said valve gear, said lash adjusting means further including means biasing said reaction surface away from cam face;

(d) said body means including structure defining a fluid passage from said wear resistant surface to said one-way valve means for communicating fluid thereto upon installation of said tappet in an engine and supplying pressurized fluid to said passage; and,

(e) means retaining said lash adjusting means in said hub.

Re. 32,168

DISTRIBUTOR FOR CONTACTLESS IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

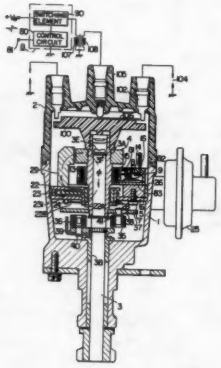
Takashi Yoshinari, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Original No. 4,307,698, dated Dec. 29, 1981, Ser. No. 15,153, Feb. 26, 1979. Application for reissue Dec. 28, 1983, Ser. No. 566,155

Claims priority, application Japan, Feb. 24, 1978, 53-19695

Int. Cl.[4] F02P *7/067*

U.S. Cl. 123—647 **25 Claims**



16. A distributor for a contactless ignition apparatus, the distributor comprising a housing means, a distributor shaft means rotatably mounted in the housing means, means including a stator means for forming a closed magnetic loop, means for mounting the stator means so as to be adjustably displaceable, a base member fixed to said housing means for rotatably supporting the mounting means for the stator means, an annular pick-up coil means coaxially disposed around said distributor shaft means and arranged to cross a portion of the magnetic loop so as to enable a detecting of changes in the magnetic fluxes occurring in the magnetic loop, an ignition control circuit means operatively connected to said pick-up coil means for interrupting a primary current of an ignition coil means in response to a detection signal generated in the pick-up coil means, and means for mounting the pick-up coil means and said ignition control circuit means of a portion of the fixed base member so as to prevent a relative rotation between the ignition control circuit means and the pick-up coil means.

Re. 32,169

THERMAL EXCHANGER

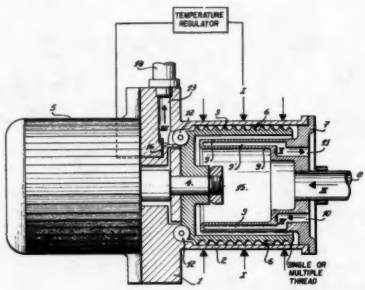
Tadeusz Piotrowski, Vincennes, France, assignor to Etablissement Euroburner, Vaduz, Liechtenstein

Original No. 4,232,733, dated Nov. 11, 1980, Ser. No. 39,553, May 16, 1979. Continuation of Ser. No. 817,034, Jul. 19, 1977, abandoned. Application for reissue Aug. 10, 1982, Ser. No. 406,999

Claims priority, application Switzerland, Jul. 23, 1976, 9446/76

Int. Cl.[4] F28D *11/02;* **F28F** *13/12*

U.S. Cl. 165—89 **30 Claims**



10. For use in an exterior heat utilization circuit, a compact heat exchange unit comprising two fluid connections for connecting said unit with said utilization circuit for the input to and outlet of heat exchange fluid from said circuit, said unit comprising:

(a) a heating wall for heating said fluid and a heating chamber extending along said heating wall;

(b) means for heating said heating wall to provide more than about 1.8 W/cm^2 to said heat exchange fluid;

(c) a pump for circulating said fluid over said heating wall through said heating chamber; and

(d) stirring means for stirring said fluid circulating in said heating chamber and including means immediately adjacent to said heating wall for preventing localized overheating in said fluid resulting in decomposition thereof by sweeping said fluid from said heating wall.

Re. 32,170

MACHINE-RETRIEVABLE CARD ANDCARD RETRIEVAL APPARATUS AND METHOD THEREFOR

Paul Neumeier, Loveland, Ohio, assignor to O. K. Partnership, Cincinnati, Ohio

Original No. 4,330,063, dated May 18, 1982, Ser. No. 125,975, Feb. 29, 1980. Application for reissue May 7, 1984, Ser. No. 608,032

Int. Cl.[4] B07C *3/20*

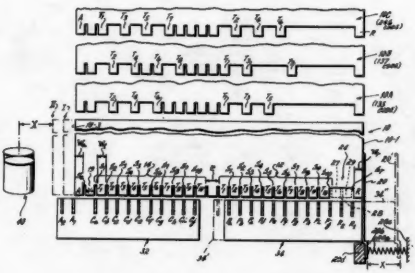
U.S. Cl. 209—608 **48 Claims**

31. A method of selecting a desired card encoded along a sorting edge thereof from a deck of similarly encoded undesired cards, said desired and undesired cards each including leading and trailing edges between which is located said sorting edge having code-bearing teeth and notches, comprising:

(*a*) *combining the desired and undesired cards into a single deck with their sorting edges aligned;*

(*b*) *introducing a sorting element, which is disposed transversely relative to the sorting edges of the desired and undesired cards, into the notch of all the cards associated with the first encoded digit of the desired card and separating the single deck of cards into only (1) a first group containing only cards which each are encoded with the first digit and (2) a second group containing only the remaining cards which each are not encoded with said first digit, the first and second groups being physically separated from each other in a direction parallel to said sorting edges thereof a distance equal to the width of one tooth;*

(*c*) *introducing a sorting element transversely disposed to the sorting edges of all cards into the notch associated with the second encoded digit of the desired card located in the first group and selectively separating the first and second groups of cards into only (1) a third group containing cards which each are encoded with both the first digit and the second digit, and (2) a fourth group collectively containing the remaining cards which do not each contain both the first and second encoded digits, the fourth group consisting of only two subgroups of cards which are separated relative to each other a distance equal to the width of one tooth in a direction parallel to their*



respective sorting edges, said third group of cards being separated from each of said two subgroups of the fourth group a distance of at least one tooth width in a direction parallel to the sorting edges thereof;

(*d*) *combining the two subgroups of the fourth group of cards into a single combined fourth group of cards, said combined fourth group of cards being spaced from the third group of cards by at least one tooth width in a direction parallel to the sorting edges thereof; and*

(*e*) *introducing a sorting element disposed transversely relative to the sorting edges of the cards into the notch associated with the third encoded digit of the desired card located in the third group and separating the third group of cards and the combined fourth group of cards into only (1) a fifth group containing cards each having all three of the encoded first, second, and third digits and (2) a sixth group containing the remainder of the cards, the sixth group consisting of only two subgroups spaced relative to each other one tooth width apart in a direction parallel to the sorting edges thereof, said two subgroups of said sixth group collectively containing all cards not each having all said first, second, and third encoded digits, said fifth group of cards being spaced from each of the two subgroups of the sixth group by a distance equal to at least one tooth width in a direction parallel to the sorting edges thereof.*

Re. 32,171

METHOD FOR THE MANUFACTURE OF AN ELECTRET FIBROUS FILTER

Jan van Turnhout, Delft, Netherlands, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

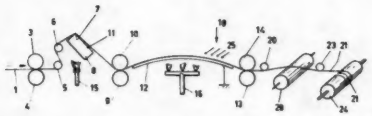
Reissued No. dated Oct. 27, 1981, Ser. No. 929,680, Jul. 31, 1978.

Original No. 3,998,916, dated Dec. 21, 1976, Ser. No. 561,872, Mar. 25, 1975. Continuation of Ser. No. 315,139, Oct. 26, 1981, abandoned, which is a division of Ser. No. 929,680, Jul. 31, 1978, now Re. 30,782. Application for reissue Aug. 1, 1983, Ser. No. 517,937

Claims priority, application Netherlands, Mar. 25, 1974, 7403975

Int. Cl.[4] D01D *5/42*

U.S. Cl. 55—155 **7 Claims**



49. An electret fibrous web having unique filtration properties prepared by a method comprising the steps of:

continuously feeding a film of highly molecular non-polar material;

heating said film;

stretching said film along the longitudinal axis thereof as defined by the path of movement of said film;

homopolarly electrically charging at least one side of said film;

fibrillating the charged film into fiber material; and

collecting the fiber material.

Re. 32,172

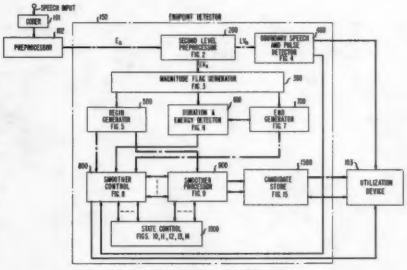
ENDPOINT DETECTOR

James D. Johnston, Warren, N.J.; Lori F. Lamel, Cambridge, Mass.; Lawrence R. Rabiner; Aaron E. Rosenberg, both of Berkeley Heights, N.J., and Jay G. Wilpon, Warren, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,370,521, dated Jan. 25, 1983, Ser. No. 218,207, Dec. 19, 1980. Application for reissue Jan. 25, 1985, Ser. No. 694,832

Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—46 **22 Claims**



1. **[**Apparatus**]** *A speech recognizer including apparatus* for determining endpoints of **[**an applied**]** *a* speech utterance **[**in a noise prone environment comprising**]** *which comprises:*

means for receiving **[**an input signal including a**]** *the* speech utterance;

means responsive to said **[**input signal**]** *speech utterance* for generating digital signals corresponding thereto;

means responsive to said digital signals for developing signals representative of the energy levels of said digital signals;

means responsive to said energy level signals for detecting the endpoints of said [applied] speech utterance; characterized in that said endpoint detecting means (150) comprises:

means (300, 500, 600, 700) responsive to said energy level signals for developing [a plurality of] *one or more* energy signal pulses, [each] *said* energy signal [pulse] *pulses* corresponding to a sequence of said energy level signals which exceeds a prescribed level for at least a predetermined period of time; and

means (800, 900, 1000) responsive to said energy signal pulses for developing [a plurality of] *one or more* endpoint candidate signals, [each of] said endpoint candidate signals being representative of probable beginning and ending points of said [applied] speech utterance.

PATENTS

GRANTED JUN. 3, 1986

ERRATA

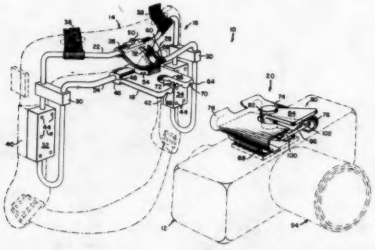
For CLASS	See PATENT NO.
073–129	4,592,217
530–350	4,592,863
530–356	4,592,864
558–002	4,592,871
558–281	4,592,872
558–059	4,592,873
558–283	4,592,874
514–373	4,593,098
585–415	4,593,133
585–445	4,593,134
585–446	4,593,135
585–446	4,593,136
585–467	4,593,137
585–481	4,593,138
585–500	4,593,139
585–508	4,593,140

PATENTS

GRANTED JUNE 3, 1986

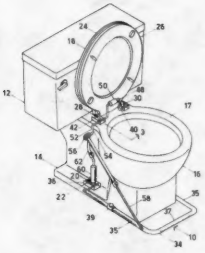
GENERAL AND MECHANICAL

4,592,096
LATCH FOR MOUNTING A GOGGLE SYSTEM TO A FACE MASK
W. Michael Glasheen, North Reading, Mass., assignor to Baird Corporation, Bedford, Mass.
Filed Jul. 5, 1984, Ser. No. 627,960
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—427 **9 Claims**



1. A latch to mount a goggle system to a face mask comprising:
(a) mounting means secured to said face mask;
(b) a tongue angularly adjustably secured to said mounting means; and
(c) receiving means for said tongue secured to said goggle system, including means for securing said tongue within said receiving means;
(d) said mounting means comprising a pair of wires formed of horizontal and vertical sections, said pair of wires in said horizontal section being offset vertically so as to form a top and a bottom wire, a member secured about said top wire and operatively connected to said tongue to secure said tongue angularly adjustably about said horizontal section.

4,592,097
SEAT LIFTER
Neil L. Zimmerman, 743 Williamson St., Madison, Wis. 53703
Filed Feb. 6, 1984, Ser. No. 577,568
Int. Cl.[4] A47K *13/10*
U.S. Cl. 4—251 **13 Claims**

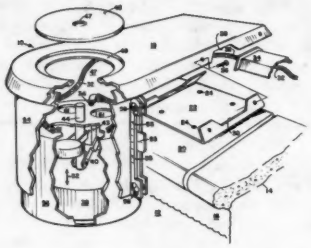


1. A toilet seat lifter for use with a conventional floor-supported toilet having a generally horizontal base flange resting on the floor, toilet attachment bolts engaged with the floor and extending upwardly through the base flange with toilet attachment bolts nuts threadedly engaged thereon and adapted to be tightened down on the base flange to secure the toilet to the floor, a bowl with a generally horizontal rim, seat attachment bolts, and a seat hingedly attached to the rim of the bowl at a rearward location thereon by the seat attachment bolts, which extend downwardly through the rim, the seat having a closed position wherein the seat extends substantially horizontally and an open position wherein the seat extends substantially vertically, the seat having an underside including surfaces presenting downwardly when the seat is in its closed position, the toilet seat lifter comprising:
(a) a foot pedal adapted to be hingedly attached to the toilet and including at least two foot pedal support brackets, each foot pedal support bracket having a hole extending therethrough that is adapted to receive a toilet attachment bolt, whereby the foot pedal support bracket may be attached to the toilet with one foot pedal support bracket on either side of the toilet, the foot pedal having two substantially straight, forward extending side portions, one of which is hingedly attached to each of the foot pedal support brackets, and a front portion connecting the two side portions, the front portion connected to the two side portions, the front portion being adapted to pass around the front of the toilet;
(b) lifting means for lifting the seat from its closed position toward its open position, the lifting means being adapted to be hingedly attached to the toilet by at least one seat attachment bolt without permanent alteration of the toilet, the lifting means including at least one support bar bracket adapted to be mounted between the bowl rim and a bearing member by a seat attachment bolt, the bearing member supporting a hinge axle for rotation of the seat, a support bar rotatably mounted to the support bar bracket, the support bar being adapted to rotate about an axis parallel to that of the hinge axle, the axis being located under the seat and forward of the hinge axle the support bar having a member extending parallel to the axis of rotation of the support bar under the seat at a position forwardly of the hinge axle, the support bar also including a lever portion extending away from the axis of rotation of the support bar at a position outwardly of the support bar bracket so that the lever may freely rotate without interference from the rim of the bowl; and
(c) a mechanical linkage connected between the foot pedal and the lever of the lifting means such that the lifting means lifts the seat toward the open position when the pedal is depressed by the foot of a user.

4,592,098
LIQUID LEVEL CONTROL SYSTEM
Herbert Magnes, 2612 Obelisco Pl., Carlsbad, Calif. 92008
Filed May 10, 1985, Ser. No. 732,705
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—508 **8 Claims**

1. A liquid level control system for use with a swimming pool or the like comprising:
a pool reservoir;
a source of liquid under pressure;
a first valve means connected between said source of liquid under pressure and said pool reservoir, said first valve means pivotly operable between open and closed states, said open state allows liquid to flow from said source of liquid under pressure into said pool reservoir and said closed state terminates said flow, the state of said valve is determined by a first predetermined level of liquid in said reservoir; and
a second valve means connected in series with said source of liquid under pressure and said first valve means, said second valve means is operable only from a normally open

to a biased closed state, said second valve changes from its normally open state to its biased closed state when a second predetermined level of liquid in said pool reservoir is exceeded.



4,592,099

TILTABLE BATHTUB FOR INVALIDS

John R. Zellner, 839 E. University Ave., Auburn, Ala. 36830

Filed Aug. 6, 1984, Ser. No. 638,030
Int. Cl.[4] A47K *3/022*
U.S. Cl. 4—540 **5 Claims**

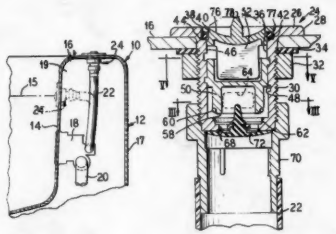
1. A bathing device having a tub which may be tilted to a non-use position about a horizontal axis to raise and lower one side for safe and easy access by the bather comprising a bathtub having two opposed upstanding walls, an upright member located adjacent each of said opposed walls, a pivot member attached to each upright member and engaging the adjacent tub wall to allow said tub to tilt on said pivot about said horizontal axis above the center of gravity of said tub, a body rest platform within the tub mounted on at least one of said pivots for rotating movement from a non-use position to a use in-tub position and vice versa, said use position being such that the user can gain lateral access to said body rest platform without the hindrance of a tub wall when said tub is tilted to its non-use position and when said tub is in a use position said body rest platform will provide support for user without said body rest platform contacting said tub and in a non-use position said body rest platform is moved away from said tub for tub cleaning.

4,592,100

AIR CONTROL VALVE

Joeab A. Robertson, Benton; Virgil J. Waldorf, Little Rock; Robert D. Wilkes, Little Rock, and Joe D. Pucket, Little Rock, all of Ark., assignors to Jacuzzi Inc., Little Rock, Ark.

Filed Sep. 4, 1984, Ser. No. 646,538
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—492 **11 Claims**



1. A fluid control valve assembly comprising:

a valve body adapted to be mounted through a wall,

said valve body having a cylindrical bore therethrough and at least one opening through a side wall thereof to communicate with said bore thereby forming a fluid passage,

a movable valve member carried in said bore and actuated by a control knob engaged in said valve body, said valve member movable in said fluid passage to selectively constrict or dilate said passage,

said control knob accessible on a side of said mounting wall opposite the location of said valve body opening,

said control knob and said valve member being rotatably movable relative to said valve body, and said valve member being axially movable relative to said control knob and said valve body,

said control knob having an axially extending tongue portion received in slots in said movable valve member to permit said valve member to move axially relative to said control knob while still being rotatably actuated by said knob,

a check valve member positioned between said movable valve member and said air conduit to prevent back flow of water through said valve assembly,

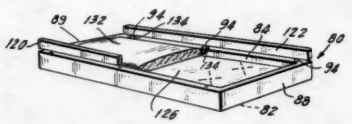
whereby fluid enters said valve body remote and isolated by said mounting wall from said control knob.

4,592,101

SOFA-BUNK BED COMBINATION WITH PIVOTABLE CUSHION

Elwin H. Page, 2810 E. 26th St., Brooklyn, N.Y. 11235

Continuation-in-part of Ser. No. 605,598, Apr. 30, 1984, Pat. No. 4,555,821. This application Aug. 24, 1984, Ser. No. 643,886
Int. Cl.[4] A47C *17/22, 17/32*
U.S. Cl. 5—9 R **6 Claims**



1. A sofa-bunk bed combination comprising:

a bottom unit, comprising a bottom support for defining a bottom bunk-sofa seat; the bottom support having a front side, a rear side and two lateral sides between the front and rear sides;

upright elements at the lateral sides of the bottom support toward the rear side thereof;

an upper unit comprising an upper support including an upper resilient structure for serving as an upper bunk when the combination is in the bunk bed mode and for serving as a sofa seat back when the combination is in the sofa mode; the upper support also having a respective rear side, an opposite front side, and two lateral sides between the front and rear sides; a hinge connection between the upper support and the upright elements of the bottom unit for enabling pivoting of the upper unit between the bunk bed mode, wherein the upper support is upraised horizontally, and the sofa mode, wherein the upper support is suspended down, such that the front side of the upper support is down toward the lower support;

the upper support being non-foldable, whereby it maintains the same dimensions when it is in the bunk bed mode and when it is extending downward in the sofa mode; during pivoting of the upper support between the upraised bunk bed mode and the downwardly inclined orientation in the sofa mode, the bottom support remaining stationary and non-shifting;

a cushion for being carried upon the upper support;

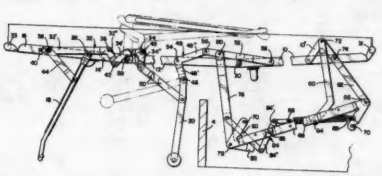
means attaching the cushion pivotally at the rear side of the upper unit, such that the cushion may be pivoted upwardly off the upper support and downwardly to rest upon the upper support.

4,592,102

MECHANISM FOR A SOFA SLEEPER

Ned W. Mizelle, P.O. Box 5985, High Point, N.C. 27262

Filed Aug. 16, 1984, Ser. No. 641,243
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—13 **29 Claims**



1. A mechanism for supporting a mattress in an article of furniture such as a sofa sleeper, said mechanism comprising:

a back rail, a long center rail pivotally connected to the forward end of the back rail, a short center rail pivotally connected to the forward end of the long center rail, and a front rail pivotally connected to the forward end of the short center rail,

said rails being pivotally movable from a sleeping position where they are generally aligned and horizontal to a seating position where said back rail and said short center rail are generally vertical and said front rail and said long center rail are generally horizontal, said front rail when in the seating position lying above the long center rail to form a cavity for holding portions of a mattress folded therewithin,

said mechanism being arranged so that movement of the rails, from the sleeping position to the seating position occurs in first and second phases and includes a stable intermediate position where the back rail and long center rail occupy the positions they had in the sleeping position and the front rail lies above and is generally horizontal and parallel to the long center rail, said first phase of movement including pivotal movement of the front rail and the short center rail while the long center rail and back rail are stationary, said second phase of movement including pivotal movement of the back rail relative to the long center rail while the front rail and short center rail remain stationary with respect to the long center rail,

a leg support lever pivotally connected to said long center rail, a center leg pivotally connected to said leg support lever, said center leg being movable from a lower floor-engaging position to a partially raised position and to a fully raised position,

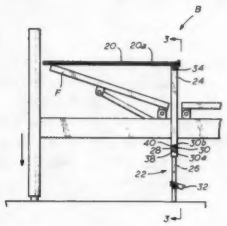
means for moving said center leg to its partially raised position during said first phase in response to pivotal movement of said short center rail relative to said long center rail, and means for moving said center leg to its fully raised position during said second phase in response to movement of said back rail from its generally horizontal position to its generally vertical position.

4,592,103

LEDGE BED APPARATUS WITH SAFETY ENGAGING MECHANISM

William L. Lindley, P.O. Box 3105, Conroe, Tex. 77305-3105

Filed Dec. 21, 1984, Ser. No. 684,628
Int. Cl.[4] A61G *7/06, 7/02*
U.S. Cl. 5—65 **24 Claims**



1. A ledge bed apparatus adapted for use with a patient care bed having a vertically movable bed frame, comprising:

(a) a mattress support member adapted to be positioned on the bed frame; and

(b) a leg assembly comprising:

(i) an upper leg portion attached to said mattress support member and extending substantially vertically therebeneath,

(ii) a lower leg portion pivotally attached to said upper portion and pivotable into substantially vertical alignment therewith,

(iii) means for locking said lower leg portion in alignment with said upper leg portion when said lower leg portion is first pivoted into alignment with said upper leg portion and said leg assembly is subsequently vertically loaded by lowering the bed frame so that said lower leg portion engages a load bearing surface and at least a portion of said mattress support member is supported by said leg assembly in a position elevated with respect to the bed frame, thereby forming a ledge; and

(iv) automatic means for releasing said locking means and positioning said lower leg portion at an angle with respect to said upper leg portion when said vertical loading is removed by raising said mattress support member so that said lower leg portion is disengaged from said bearing surface, thereby removing said ledge.

4,592,104

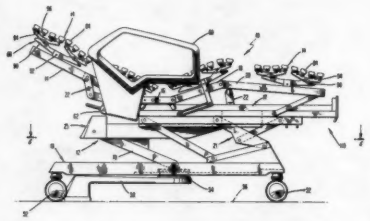
HOSPITAL BED

L. Dale Foster, Brookville, and William H. Peck, Oldenburg, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Dec. 6, 1983, Ser. No. 558,460
Int. Cl.[4] A61G *7/06*
U.S. Cl. 5—66 **16 Claims**

1. In combination, a wheeled hospital bed and a drive unit supported solely by said bed, said bed comprising a plurality of articulated frame sections, at least one rotatably driven shaft, linkage means interconnecting said driven shaft and said frame sections for articulating the latter in response to rotation of said

drive shaft, and first guide means, said drive unit including at least one motor and rotatable drive shaft, and second guide means arranged to interact with said first guide means of said bed when said bed is merged horizontally with said drive unit in order to orient said bed and drive unit such that said driven shaft and drive shaft are mutually aligned, said drive shaft and



driven shaft including self-coupling means for establishing a drive connection therebetween in response to relative horizontal movement between said drive shaft and said driven shaft when said bed is merged with said drive unit, one of said first and second guide means comprising rotary mounted wheels, and the other of said first and second guide means comprising a track engageable with said wheels.

4,592,105

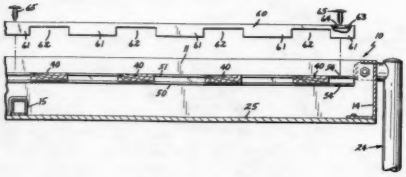
BED FRAME CONSTRUCTION

George E. McNamara, Minneapolis, Minn., assignor to Sico Incorporated, Minneapolis, Minn.

Filed Feb. 14, 1984, Ser. No. 580,001

Int. Cl.[4] A47C *23/06*

U.S. Cl. 5—238 **3 Claims**



1. A bed frame, comprising:

a support frame including a pair of spaced apart parallel side frame members;

a plurality of bed slats having a length for fitting between the side frame members to support a mattress thereon;

each of said side frame members having a U-sectioned slat holder strip having a base portion secured adjacent the side frame members and with the leg-portions of the strip projecting inwardly of the bed frame and spaced apart to define a slot for receiving the ends of the slats therebetween;

L-sectioned spacer strips for said slat holders, each of said spacer strips having a base portion for mounting in abutment with a leg portion of said U-sectioned slat holders, and having a plurality of spaced tab portions at an angle thereto separated by recess portions sized according to the width of the slat ends; and

separable fastener means for attaching said spacer strips to said slat holders with said tab portions between adjacent slats to thereby space them from one another.

4,592,106

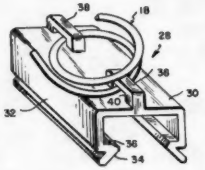
ANCHOR FOR SECURING THE LOWER END OF A SPRING

Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Nov. 28, 1984, Ser. No. 675,891

Int. Cl.[4] A47C *23/053*

U.S. Cl. 5—245 **5 Claims**



1. An anchor, for securing the lower end of a coil spring to a frame member embodying spaced, parallel supports, said supports having vertically-spaced, horizontal, upwardly and downwardly-facing sides, said anchor comprising a base plate corresponding in transverse width to the support and in length to an incremental portion thereof for sliding engagement with the upwardly-facing side of the support, a pair of longitudinally-spaced lugs on the upwardly-facing side of the base plate and means for slidably securing the base plate to the support comprising transversely-spaced flanges at the opposite edges of the base plate depending from the downwardly-facing side thereof for engagement with the sides of the support, said flanges being yieldably resistant to displacement and latch elements at the lower edges of the flanges engaged with the downwardly-facing side of the support.

4,592,107

PROCESS AND APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE MATERIAL IN ROPE FORM

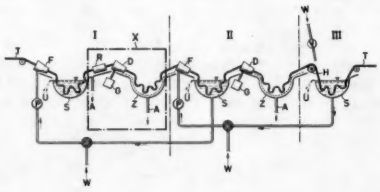
Hans-Ulrich von der Eltz, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 625,104

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323381

Int. Cl.[4] D06B *21/00*

U.S. Cl. 8—149.1 **10 Claims**



1. A process for treating textile woven or knitted fabric rope guided through jet apparatus during the continuous passage of the rope through various successive but separate wet-treatment zones of the apparatus, the process comprising the steps of supplying a treatment liquor to the textile rope entering a wet-treatment zone as the rope passes through a liquid-operated jet arranged to move the rope along its path of travel, simultaneously forcing the rope into an immediately following storage space filled with the same treatment liquid, where the continuously moving rope is subjected to the action of the treatment liquid, continuously removing the textile rope thus wet-treated from the storage space by a downstream steam- or

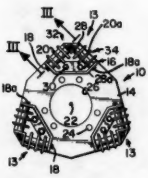
gas-operated jet, and feeding the rope into a subsequent interim store where the continuously moving rope is largely freed of the previously applied treatment liquid.

4,592,108

TOOL AND METHOD FOR SCARIFYING A SURFACE

John M. Svendsen, New Hope, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Jan. 3, 1983, Ser. No. 455,209
Int. Cl.[4] A47L *13/02*
U.S. Cl. 15—4 **27 Claims**



1. A tool for connection to a rotary power machine for removing a coating from a surface, said tool comprising:

first disc-like means for scarifying a plurality of parallel first pathways in the coating on the surface leaving a plurality of ridges intermediate said first pathways;

second disc-like means for scarifying a plurality of parallel second pathways in the coating on the surface, all of said second pathways being intermediate said first pathways and serving to remove coating intermediate said plurality of first pathways; and

separate support means for supporting said first and second scarifying means with respect to said rotary power machine.

4,592,109

TOOTHBRUSH WITH A DEVICE FOR THE PERFECT ORIENTATION OF THE BRISTLES WITH RESPECT TO THE SURFACE OF THE TEETH

Giorgio Borea, 27 Via S. Vitale, Bologna, Italy (40125), and Nerio Pantaleoni, Bologna, Italy, assignors to Giorgio Borea, Bologna, Italy

Filed Oct. 23, 1984, Ser. No. 663,970
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—172 **7 Claims**

5. In a toothbrush having a bristle-bearing head portion including bristles having ends defining a surface for engaging teeth to be brushed, and a radially non-symmetrical, anatomically-shaped handle portion having a longitudinal extent, the head portion being securable at a securing end thereof to the front end of the handle portion in a first reference position, the improvement comprising:

annular means, carried by said front end of said handle portion and said securing end of said head portion, for securely positioning and holding said teeth engaging surface in a selected one of several other discrete positions circumferentially displaced from said first reference position about said handle portion longtudinal extent; and

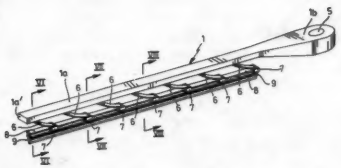
means carried by each of said head portion and said handle portion, for indicating the circumferential displacement of said selected discrete position relative to said first reference position.

4,592,110

WIPER ASSEMBLY FOR MOTOR VEHICLES

José Verton, Saint-Vincent, Belgium, assignor to Champion Spark Plug Europe S.A., Virton, Belgium

Filed Sep. 7, 1984, Ser. No. 648,303
Claims priority, application France, Sep. 13, 1983, 83 14533
Int. Cl.[4] B60S *1/32*
U.S. Cl. 15—250.35 **15 Claims**



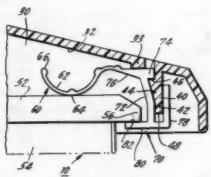
1. A wiper assembly, in particular for motor vehicles, comprising an elongate wiper arm having means for connecting the wiper arm to a driving shaft, a resilient wiping element reinforced by a pressure distributing rod or flexor, characterized in that a plurality of separate and longitudinally spaced elongate leaf springs are provided, each having spaced ends, means attach one end of each of the plurality of springs substantially fixedly to the wiper arm so that the attached end of each of the plurality of springs cannot move relative to the wiper arm at a plurality of longitudinally spaced points on said arm, and means attach the other end of each of the plurality of springs to the flexor at a plurality of longitudinally spaced points on the flexor said leaf springs being substantially parallel with each other and transmitting wiper arm pressure directly to said flexor.

4,592,111

SPRING RETAINER FOR VACUUM CLEANER NOZZLE BRUSH

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Feb. 25, 1985, Ser. No. 704,944
Int. Cl.[4] A47L *9/06*
U.S. Cl. 15—371 **15 Claims**



1. A nozzle with a retractable brush for the intake of a vacuum cleaner, wherein the nozzle comprises:

a nozzle housing having a bottom side and having lateral ends; a suction inlet which opens to the bottom side of the housing; the inlet having a first side with respect to motion of the nozzle housing; the first side of the inlet being defined in the housing;

a respective brush carrier in the housing and located toward each lateral end of the housing and also located outside of and at the first side of the inlet;

a brush extending along the first side of the inlet; the brush including a supporting element for being supported in the housing and including brushing means supported beneath the supporting element and projecting beneath the bottom

side of the housing for brushing material before the brush as the nozzle housing is moved;

a respective integral brush spring and spring retainer for each brush carrier, and comprising:

a respective retaining means for engaging the respective brush carrier in the housing; each retaining means also being for holding the brush supporting element removably in the housing,

a spring attached to and extending from the retaining means, the spring extending into contact with the brush supporting element and normally urging the brush supporting element out of the bottom side of the housing, and

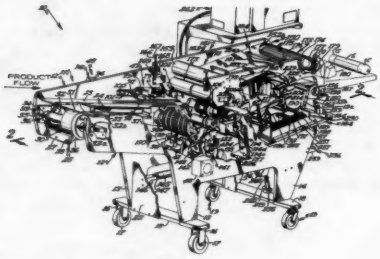
a shelf formed on the retaining means and projecting beneath a part of the brush supporting element for preventing the brush supporting element from moving fully out of the housing while permitting the brush supporting element to shift into the housing against the bias of the spring.

4,592,112

DECLIPPER APPARATUS

Lyndon R. Leining, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Filed Apr. 29, 1985, Ser. No. 728,510
Int. Cl.[4] A22C *11/00*
U.S. Cl. 17—45 **16 Claims**



1. A continuous process for removing the clips from opposite ends of an elongate sausage stick and the casing and applying the label to the sausage stick, comprising:

sequentially moving sausage sticks to be declipped in a predetermined direction of travel, each sausage stick being disposed transversely of the direction of travel and, during said travel, moving each sausage stick to a clamping station, interrupting the travel of each sausage stick and mechanically gripping the clips on opposite ends of a sausage stick with a mechanical gripping medium,

rotating the sausage stick to cause the clips clamped by the clamping medium to be twisted from the casing, and

engaging each sausage stick with a rolling and pressure applying medium to cause each sausage stick to be rolled across an adhesive coated label to thereby cause the label to be progressively applied to the sausage stick.

4,592,113

FISH FILETING KNIFE

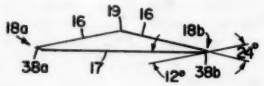
Donald L. Selfors, Minneapolis, Minn., assignor to G & D Investments, Ltd., Minneapolis, Minn.

Filed Jul. 31, 1984, Ser. No. 636,159
Int. Cl.[4] A22C *25/16*
U.S. Cl. 17—66 **9 Claims**

1. A fish filleting knife comprising:

(a) an elongated flat metal blade having a pair of cutting edges along each side of said blade, said flat metal blade having a substantially planar lower surface and an upper surface which is beveled downwardly along each side of said blade, said lower surface beveled upwardly at about a 12 degree angle along each side of said blade to meet said downward bevel on said upper surface to provide said cutting edges so that each of said cutting edges is elevated from said planar lower surface and so that said lower surface provides a skin anchoring surface proximate the cutting edge to facilitate the clean separation of flesh and skin;

(b) a handle which is offset from said blade; and



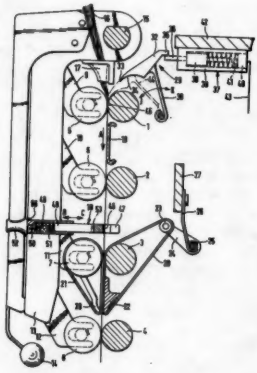
(c) a connecting portion which interconnects said blade and said handle, said connecting portion being inclined with respect to said blade and said handle such that said blade may rest uniformly on a surface while a users hand is gripped around said handle.

4,592,114

DRAFTING ROLLER ARRANGEMENT FOR SPINNING MACHINES

Fritz Stahlecker, Josef-Neidhart-Strasse 18,, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,076
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327966
Int. Cl.[4] D01G *31/00*; D01H *5/38*
U.S. Cl. 19—0.25 **17 Claims**



1. A drafting arrangement for drafting sliver for spinning machines comprising:

at least three pairs of drafting rollers forming at least a first, second and third drafting zone in the conveying direction of a sliver,

sliver stopping means assigned to the first drafting zone for stopping the sliver in response to a detected disturbance,

a sliver condenser arranged upstream of the last drafting zone in the conveying direction of a sliver and having sliver guide surfaces tapering narrowingly in the direction of sliver travel, said sliver condenser being provided with threading slot means,

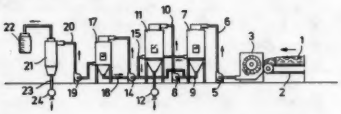
and condenser holder means for holding the condenser in such a way that it can be selectively moved out of the last drafting zone in the conveying direction of a sliver transversely to the sliver conveying direction in a direction away from the threading slot means side of the sliver condenser.

4,592,115

APPARATUS AND PROCESS FOR SEPARATING CELLULOSE FLUFF FIBERS FROM WASTE FIBROUS MATERIAL

Sten Holmstrom, Bromma, Sweden, assignor to Mo och Domsjo AB, Ornskoldsvik, Sweden

Filed Dec. 18, 1984, Ser. No. 682,879
Int. Cl.[4] D01G *5/00*
U.S. Cl. 19—82 **5 Claims**



1. Apparatus for separating cellulose fluff fibers from waste fibrous material resulting from the manufacture of absorbent products from cellulose fluff fibers, comprising:

(1) means for disintegrating the waste fibrous material into particulate form small enough to entrain in air;

(2) means for entraining particles of waste fibrous material in air;

(3) means for conveying the air with entrained particles of waste fibrous material into a cellulose fluff fiber separator;

(4) the cellulose fluff fiber separator comprising a cylindrical housing having an inlet at one end for air and entrained waste fibrous material particles;

(5) an apertured cylindrical separator disposed in the housing and having a central passage in flow connection with the inlet; and spaced from the internal wall of the housing so as to define an annular chamber therebetween;

(6) a first outlet in the housing in flow connection with the central passage of the cylindrical separator;

(7) a second outlet in the housing in flow connection with the annular chamber;

(8) the cylindrical separator having apertures therethrough large enough to permit cellulose fluff fibers to pass therethrough but small enough to screen out larger non-fluff material from the waste fibrous material;

(9) means for drawing air and entrained cellulose fluff fibers passing through the apertures from the housing through the second outlet;

(10) means for drawing air and entrained waste fibrous material not passing through the apertures from the housing through the first outlet; and

(11) means in connection with the first outlet for controlling flow therethrough of air and entrained waste fibrous material, for providing a balance between flow rate and differential pressure across the apertured separator sufficient to prevent blockage of the apertures in the separator by waste fibrous material too large to pass through while permitting cellulose fluff fibers to pass through.

4,592,116

ROPE SECURING DEVICE

Harold B. Christensen, 860 Missouri Ave., Longmont, Colo. 80501

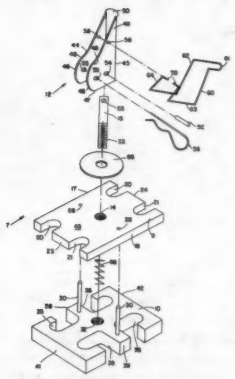
Filed Dec. 28, 1984, Ser. No. 687,571
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—132 R **6 Claims**

1. A securing device for securing the positioning of a rope-like article, said device comprising:

a first plate having notches therein for receiving a rope-like article to be secured, said first plate having a central aperture;

a second plate adjacent to first plate and having notches therein for receiving said rope-like article to be secured, said second plate having a central aperture with threads therein;

a mounting pin having threads on one end portion thereof, and a second end portion, said mounting pin being received through said central aperture of said first plate and having said threads on said one end portion mating with said threads of said central aperture of said second plate to establish coarse positioning between said plates; and



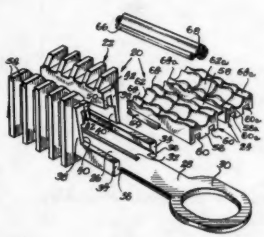
an actuator mounted on said end portion of said mounting pin, said actuator having a cam adjacent to said first plate to cause movement of said first plate towards said second plate upon actuation of said cam to the closed position, said actuator also having a lever for actuating said cam.

4,592,117

DROP WIRE CLAMP

William E. Ruehl, 315 Surrey Rd., Wheeling, Ill. 60090; John N. Schavilje, 812 S. See-Gwun, Mt. Prospect, Ill. 60056, and Edwin G. Swick, 28W629 Stearns Rd., Bartlett, Ill. 60103

Filed Feb. 11, 1985, Ser. No. 700,142
Int. Cl.[4] F16B *2/02*; F16G *11/00*
U.S. Cl. 24—136 R **21 Claims**



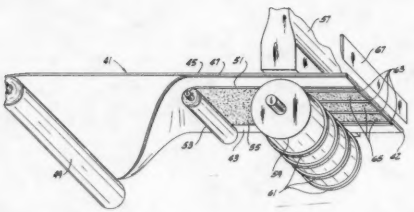
1. A clamp device for securing a cable comprising a body having longitudinally extending inner converging clamping surfaces, and a two-part wedge of molded plastic resin material having longitudinally extending external tapered surfaces engageable with said body inner converging clamping surfaces to wedge the two parts of said wedge together, each of the two parts of said wedge having a continuous longitudinally extending confronting undulating channel of uniform cross section extending from end-to-end where the crests in one channel is opposed by valleys in the opposite channel and vice-versa for clamping a cable therebetween.

4,592,118

FASTENERS FOR APPAREL AND METHODS OF MANUFACTURING THEM

Irvin S. DeWoskin, St. Louis County, Mo., assignor to Barnhart Industries, Inc., Barnhart, Mo.

Filed Nov. 18, 1983, Ser. No. 553,105
Int. Cl.[4] A44B *19/34*
U.S. Cl. 24—444 **3 Claims**



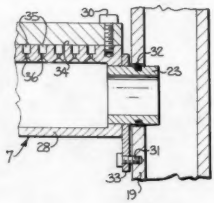
1. A bra back fastener element comprising a band of flexible base material which is heat-sealable at least at one surface thereof and a segment of fastener tape material constituting one of a hook tape or a plush tape of heat-sealable material heat-sealed to said surface by relatively narrow seals extending across the element from one side thereof to the other, wherein the band of based material is a two-ply band with plies having free margins at one end of the band for stitching thereof to another part with the latter received between said free margins.

4,592,119

AIR JET YARN ENTANGLING APPARATUS

Karl Bauer, and Michael Hanisch, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,723
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405891; Apr. 7, 1984, 3413276
Int. Cl.[4] D02G *1/16*; D02J *1/08*
U.S. Cl. 28—271 **11 Claims**



1. An apparatus for simultaneously air jet entangling a plurality of advancing multifilament yarns, and which is adapted for use in association with the drawing and warp beaming of such yarns, and comprising

a plurality of elongate air jet beams, with each beam having a longitudinal air passageway extending along its length and a plurality of parallel enclosed yarn ducts extending transversely to the longitudinal direction of the beam and being aligned in a longitudinally spaced-apart relation, and an air jet aperture communicating between said air passageway and each yarn duct,

means adapted for operatively connecting said air passageway of each beam to pressurized air supply means, and

means mounting said air jet beams such that the beams are disposed parallel to each other, and such that the beams are adjustably positioned with respect to each other and to the advancing yarns.

7. An apparatus for air jet entangling a plurality of advancing yarns, and comprising

a support frame,

an elongate hollow beam section defining a longitudinal direction extending along the length thereof and being pivotally mounted to said support frame for pivotal movement about an axis which extends longitudinally through said beam section, said beam section including a longitudinally extending internal air passageway and further including a flat exterior surface extending parallel to its longitudinal direction,

an elongate cover plate having a flat surface extending parallel to its longitudinal direction,

means releasably mounting said cover plate to said beam section with the respective flat surfaces overlying each other in a mating relationship,

a plurality of parallel channels formed in at least one of said flat surfaces, with said channels extending transversely to the longitudinal direction of the beam section and cover plate, and with the channels being longitudinally spaced apart and such that each channel defines an enclosed yarn duct, and

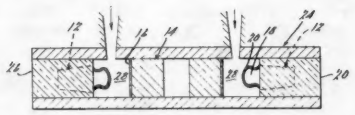
an air jet aperture communicating between said air passageway of said beam and each of said yarn ducts, and whereby the pivotal mounting of the beam section permits the beam section to be adjusted so that the yarn paths through the respective ducts may be adjusted to run through the ducts in a selected direction.

4,592,120

METHOD FOR MANUFACTURING A MULTIPLE PROPERTY INTEGRAL TURBINE WHEEL

Michael J. Egan, Milford, and Gary J. Quill, Birmingham, both of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Feb. 14, 1983, Ser. No. 466,167
Int. Cl.[4] B23P *15/04*
U.S. Cl. 29—156.8 R **2 Claims**



1. A method of making a turbine rotor comprising the steps of

coating the outer periphery of a metallic hub with a diffusion bonding material,

supporting a plurality of metallic turbine blades having dovetails on the root portions thereof, respectively, in a circumferentially spaced array in a frangible core ring, the spaces between said blades radially outwardly of the root portions thereof being filled with said frangible material but said dovetails being exposed,

coating the exposed dovetails of said blades with a diffusion bonding material,

casting a metallic blade retainer ring about said dovetails and into contact with said hub to fully encompass said dovetails and simultaneously effect diffusion of said bonding material into the dovetails of said blades and into the periphery of said hub, and

removing said frangible core ring from about said blades.

2. A method of making a turbine rotor comprising the steps of

supporting a plurality of metallic turbine blades having dovetails on the root portions thereof, respectively, in a circumferentially spaced array in a frangible core ring, the spaces between said blades radially outwardly of the root

portions thereof being filled with said frangible material but said dovetails being exposed,

coating a metallic blade retainer ring about said dovetails to fully encompass said dovetails and form a retainer ring/-blade assembly,

removing said frangible core ring from about said blades,

machining the radially inner portion of said retainer ring/-blade assembly to form a cylindrical internal surface comprising exposed portions of said retainer ring and exposed portions of the radially inner ends of said blade dovetails,

providing a hub having a radially outer cylindrical surface of a diameter acceptable within said retainer ring/blade assembly in a close fit relationship,

coating one of said cylindrical surfaces with a diffusion bonding material,

telescoping said machined retainer ring/blade assembly over said hub, and

heating the hub and retainer ring/blade assembly to a temperature sufficient to effect diffusion bonding between said hub and retainer ring and between said hub and the machined portion only of said blade dovetails.

4,592,121

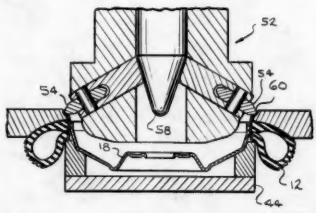
TIRE AND WHEEL ASSEMBLY

Gary L. Gray, Novi, and Leo P. Gajda, New Boston, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Jan. 31, 1983, Ser. No. 462,575

Int. Cl.[4] B21K *1/38*

U.S. Cl. 29—159.1 **5 Claims**



3. In a method of manufacturing a combination wheel and tire assembly, the steps of:

(a) providing a wheel rim wherein said rim includes a first tire bead retaining flange,

(b) placing a tire upon said wheel rim,

(c) providing a circumferential die surface about said rim so as to slide said tire toward said first tire bead retaining flange, and

(d) deforming said rim against said die surface to form a second integral and opposing tire bead retaining flange.

4,592,122

HAND APPLICATOR FOR RADIALLY ASSEMBLED SPRING RETAINING RINGS

John Sikula, Astoria, N.Y., assignor to Waldes Truarc, Inc., Long Island City, N.Y.

Filed Jun. 25, 1985, Ser. No. 748,455

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—229 **15 Claims**

1. An applicator for installing a radially assembled spring retaining ring into an external groove of a workpiece, said applicator comprising:

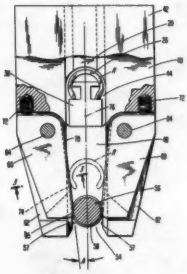
a base plate forming a fore-aft extending floor along which a retaining ring may travel, said floor having a forwardly open slot for receiving a grooved workpiece,

a pair of groove locators mounted on said base plate on opposite sides of a fore-aft axis of said floor for movement toward and away from one another, each locator comprising:

a side edge extending in a generally forward direction and positioned to be contacted by a forwardly traveling ring, and

a locator tip disposed at a forward end of said locator and arranged to enter a groove of a workpiece situated in said slot,

said side edges of said locators converging forwardly in a rest condition such that an imaginary point at which forward projections of said edges intersect is disposed forwardly of said base plate,



the point at which the spacing between said edges corresponds in dimension to the ring width occurs rearwardly of said slot such that the ring contacts said edges before entering a workpiece groove,

spring means for yieldably biasing said locators toward one another, said spring means being yieldable to allow said locators to be cammed apart by a forwardly advancing ring which contacts said edges, and

pusher means for pushing a retaining ring forwardly toward said slot and into camming relationship with said edges.

4,592,123

DEVICE FOR MANUFACTURING THERMO-INSULATED COMPOUND PROFILES FOR WINDOWS, DOORS AND FACADES

Manfred Mühle, D-4972 Löhne 2, Fed. Rep. of Germany

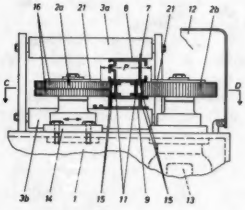
PCT No. PCT/DE84/00008, § 371 Date Sep. 21, 1984, § 102(e) Date Sep. 21, 1984, PCT Pub. No. WO84/02861, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 16, 1984, Ser. No. 662,302

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302274

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—243.5 **8 Claims**



1. Device for manufacturing thermo-insulated compound profiles for windows, doors and facades, comprising: metal profiles to be joined for forming a compound profile with at least one longitudinal groove; insulating connecting webs with a base and secured in said groove; press rollers located opposite one another in pairs at right angles to an axis of said profiles; retaining strips bounding longitudinal grooves of said

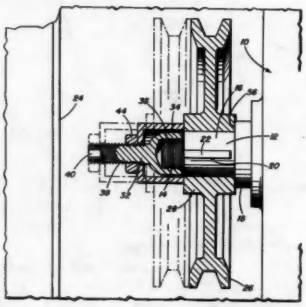
metal profiles, said press rollers pressing on outer sides of said connecting webs against said retaining strips; said press rollers pressing together said retaining strips and said base of said connecting webs; one of said press rollers comprising a roller hub and at least two forming discs displaceable dependently on each other in a plane of said roller, said discs being supported on said roller hub.

4,592,124

ACCESSORY PULLEY INSTALLATION TOOL

Herman G. Keith, Rte. 2, Box 431, Henagar, Ala. 35978, assignor to Herman G. Keith and John M. Keith, both of Henagar, Ala.

Filed Jul. 5, 1984, Ser. No. 627,681
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—264 **1 Claim**



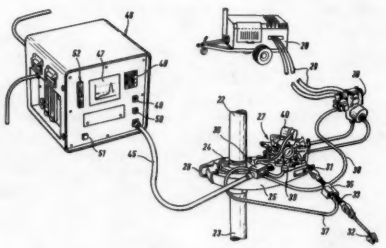
1. An accessory pulley installation tool for installing a pulley over and upon a shaft equipped with a reduced diameter threaded free terminal end and wherein only limited space is available axially outward of said free terminal end, said tool including a shank member including a first end portion defining an endwise outwardly opening threaded bore therein for threadingly receiving said threaded free terminal end therein and a second diametrically reduced externally threaded end portion, a washer adapted to engage the pulley and freely slidable on said second end portion and of an outside diameter greater than the outside diameter of said first end portion, a threaded abutment member threadingly engaged on said second end portion and of a size too great to be received through the center of said washer, a sleeve member freely slidable over said shank member first end portion, said sleeve member being shorter in length than said second externally threaded end portion and longer in length than said first end portion, said sleeve member including a centrally apertured end wall on one end thereof freely slidable on said second end portion of said shank member, the inside diameter of said sleeve member being greater than the outside diameter of said first end portion of said shank member, said sleeve member being positionable over said shank member from said second end portion thereof in lieu of said washer and with said sleeve member and threaded bore opening in the same direction, said abutment member being of a size too great to pass though said centrally apertured end wall, the terminal end of said second end portion of said shank member including connecting means for imparting manual rotary torque input to said second end portion of said shank member by a suitably shaped hand tool non-rotatably engaged with said second end portion terminal end, the diameter of said shank member second end portion being less than the diameter of said bore, said sleeve member, by being shorter than said second end portion of said shank member and by having an inside diameter greater than the outside diameter of said first end portion of said shank member and because said second end portion of said shank member is smaller in diameter than said first end portion of said shank member, being positionable closely adjacent one side of the free end of said shank member second end portion and disposed at generally 90° relative thereto and thereafter angularly displaceable 90° to a position telescoped over said shank member second end portion within an area extending outward of said free end a distance appreciably less than the length of said sleeve member.

4,592,125

METHOD AND APPARATUS FOR ANALYSIS OF TORQUE APPLIED TO A JOINT

William Skene, Aberdeen, Scotland, assignor to Salvesen Drilling Limited, Aberdeen, Scotland

Filed Oct. 2, 1984, Ser. No. 657,440
Claims priority, application United Kingdom, Oct. 6, 1983, 8326736
Int. Cl.[4] B23Q *17/00*
U.S. Cl. 29—407 **16 Claims**



1. A method of making up a joint between two mutually-engageable threaded members which have a shoulder seal incorporated therein, said method comprising continuously monitoring the torque applied to rotate a first of said members relative to the second member; continuously monitoring the engaging relationship of the first and second members between a first position and a second position; detecting torque applied adjacent the location at which shoulder engagement takes place; comparing said shoulder torque in relation to a predetermined optimum torque and predetermined maximum torque; and either applying further torque amounting to a proportion of said optimum torque if the addition of said proportion of the optimum torque to the shoulder torque does not exceed the maximum torque and thereby effecting a good joint or ceasing to apply further torque if the torque comparison indicates that a good joint cannot be achieved.

4,592,126

METHOD FOR CONSTRUCTING FURNITURE HAVING A FLEXIBLE SHEET PORTION

Donald L. Bottemiller, Wadena, Minn., assignor to Homecrest Industries Incorporated, Wadena, Minn.

Filed Dec. 14, 1984, Ser. No. 681,834
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—446 **7 Claims**

1. A method for constructing furniture having a flexible sheet in a state of tension supported by first and second spaced-apart longitudinal bars having a plurality of studs and a plurality of cross braces, each cross brace having stud engaging apertures proximate first and second ends, using a tool having a handle portion, a shank portion and a distal end portion with a stud engaging recess, the method comprising:

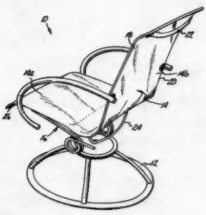
attaching the longitudinal bars to the flexible sheet such that the bars are held in a fixed position relative to the sheet and define a body support section therebetween with the studs projecting through the sheet;

inserting a first stud of the first bar through an aperture of a first cross brace;

inserting the tool through a second aperture of the first cross brace;

engaging a second stud of the second bar with the stud engaging recess of the tool;

tilting the tool away from the center of the sheet and sliding



the first cross brace down the tool until the cross brace is positioned against the sheet; and

removing the tool from engagement with the second stud so that the second stud extends through the second aperture.

4,592,127

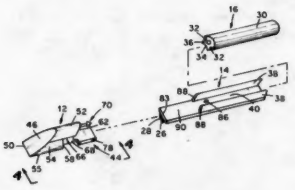
METHOD FOR SECURING THE COMPONENTS OF A DECORATIVE MOLDING SYSTEM

Melvin L. Simon, Concord, Tenn., assignor to Vinylex Corporation, Knoxville, Tenn.

Division of Ser. No. 305,616, Sep. 25, 1981, Pat. No. 4,463,539. This application Apr. 26, 1984, Ser. No. 587,169

Int. Cl.⁴ B23P *11/02*

U.S. Cl. 29—451 **3 Claims**



2. A method for attaching and confining a decorative trim to a mounting surface, comprising:

providing a channel member having a web, at least one cavity formed in the web, and a pair of longitudinal ribs extending toward each other formed along the longitudinal edges of the web;

fitting and securing a resilient decorative trim between said ribs at a spaced apart relation of said web;

providing an end tip with an exposed decorative portion, an elongated end portion, and an attachment member extending outwardly from the longitudinal axis of said elongated end portion;

inserting the elongated end portion between the web and the resilient decorative trim;

positioning the end tip adjacent to the ends of the pair of ribs;

inserting and positioning the attachment member in the cavity of the web to a depth of less than the thickness of the web so that the attachment member does not protrude through the web to secure the end tip to the channel member; and

adhesively attaching the channel member to the support surface.

4,592,128

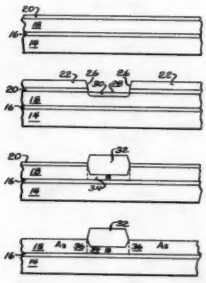
METHOD FOR FABRICATING INTEGRATED CIRCUITS WITH POLYSILICON RESISTORS

Ronald R. Bourassa, Colorado Springs, Colo., assignor to Inmos Corporation, Colorado Springs, Colo.

Filed Jun. 4, 1984, Ser. No. 616,921

Int. Cl.⁴ H01L *21/22, 21/306*

U.S. Cl. 29—571 **31 Claims**



1. In a process for fabricating polysilicon resistors over a substrate having a poly layer, including steps of doping the poly with impurities for the resistor, doping the poly for conductivity, and poly definition, the improvement comprising:

establishing a covering over the poly layer adequate to shield the underlying poly from impurities to be introduced to the poly; then providing openings in the covering to expose areas of poly; then

entering impurities into the exposed areas of poly in a concentration to establish a resistive region, said covering operating to shield the underlying poly from said impurities;

establishing a protective mask over the poly wihtout an additional masking step after said impurities have entered said exposed areas of poly; and then

further processing the resulting structure including removing parts of said covering and entering impurities into further areas of the poly using the protective mask in a concentration to render conductive said further areas of poly, and defining both said resistive region and said conductive areas of the poly to include a poly line having a part which is conductive and a part which is resistive.

4,592,129

METHOD OF MAKING AN INTEGRAL, MULTIPLE LAYER ANTIREFLECTION COATING BY HYDROGEN ION IMPLANTATION

Ronald N. Legge, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

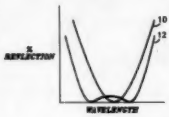
Filed Apr. 1, 1985, Ser. No. 718,316

Int. Cl.⁴ H01L *31/06;* **B05D** *3/06*

U.S. Cl. 29—572 **10 Claims**

1. A process for providing an improved antireflection coating on a substrate which comprises the steps of: forming a layer of dielectric material overlying said substrate, said layer hav-

ing a first thickness and a first index of refraction; implanting hydrogen into a surface region of said layer to form a sub layer



having a thickness less than said first thickness and an index of refraction less than said first index of refraction.

4,592,130

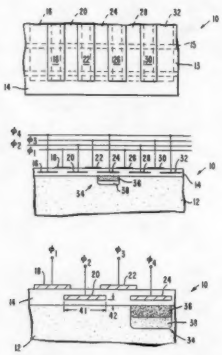
METHOD OF FABRICATING A CCD READ ONLY MEMORY UTILIZING DUAL-LEVEL JUNCTION FORMATION

Greg Nash, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 246,344, Mar. 23, 1981, abandoned, Division of Ser. No. 23,860, Mar. 26, 1979, abandoned. This application Nov. 15, 1984, Ser. No. 671,802

Int. Cl.[4] H01L *21/265, 29/78*

U.S. Cl. 29—577 C **11 Claims**



1. A method of fabricating a programmable charge coupled device non-volatile read only memory comprising the steps of:

(a) providing a semiconductor substrate of a first conductivity type;

(b) defining in said substrate a charge flow channel capable of being divided into a serial plurality of charge storage cells, each cell including an information storage segment;

(c) placing a first dopant impurity into the information storage segment of selected charge storage cells, said first dopant impurity being of said first conductivity type and having a greater impurity concentration than said substrate;

(d) placing a second dopant impurity into the information storage segments of the selected charge storage cells having said first dopant impurity, said second dopant impurity being of a second conductivity-type, opposite said first conductivity-type and being located directly above said first dopant impurity;

(e) retaining the remaining portions of the selected charge storage cells with the same dopant concentration as said substrate;

(f) retaining the remaining, unselected charge storage cells, including their respective information storage segments, with the same dopant concentration as said substrate; and

(g) forming a plurality of discrete electrodes individually overlying respective ones of said charge storage cells, a separate electrode overlying the information storage segment of each cell;

wherein a charge is capable of being accumulated in said second dopant impurity as a transferrable charge packet and said first dopant impurity is capable of providing a neutralizing effect upon the surface potential of said substrate above said first and second dopant impurities so that said transferable charge packet is capable of being transferred serially through said charge flow channel beneath said plurality of discrete electrodes by sequentially applying clocking signals to said plurality of discrete electrodes.

4,592,131

METHOD FOR MANUFACTURING RESIN-SEALED SEMICONDUCTOR DEVICE

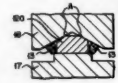
Toshikazu Deie, Aioi, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

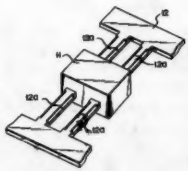
Filed Dec. 18, 1984, Ser. No. 682,841

Claims priority, application Japan, Feb. 22, 1984, 59-32069

Int. Cl.[4] H01L *21/56*

U.S. Cl. 29—588 **6 Claims**





1. A method for manufacturing a sealed semiconductor-containing element fastened to a leadframe having outer lead members comprising the steps of:

(i) sealing said element, and the portion of said leadframe to which said element is fastened, with resin;

(ii) after said sealing step collapsing a pair of adjacent corners of said outer lead members in the longitudinal direction along said members, said adjacent corners both being coplanar with either the top or bottom plane of said leadframe; and

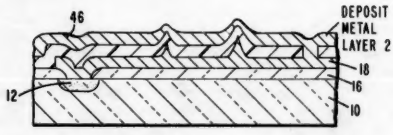
(iii) removing resin which adhered during the sealing step to the sides of said outer lead members.

4,592,132

PROCESS FOR FABRICATING MULTI-LEVEL-METAL INTEGRATED CIRCUITS AT HIGH YIELDS

William W. Y. Lee; Gareth L. Shaw, both of Fountain Valley; James W. Clayton, deceased, late of Santa Ana, and Denise Bachino, administrator, Santa Maria, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 7, 1984, Ser. No. 679,506
Int. Cl.[4] H01L *21/47*
U.S. Cl. 29—590 4 Claims



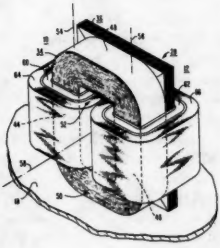
1. In a process for fabricating multi-level metal integrated circuits wherein at least first and second layers of metal are deposited above a semiconductor substrate and are separated there by an inter-layer dielectric material, the improvement comprising: forming a relatively thick photoresist coating atop said inter-layer dielectric by initially forming a first layer of photoresist on the surface of said inter-layer dielectric, then treating said first layer in a manner that makes it substantially impervious to photoresist solvents, and then forming a second layer of photoresist atop said first layer of photoresist to a thickness sufficient to cover vertical protrusions in said inter-layer dielectric resulting from hillocks or spikes in said first layer of metal, whereby the multilayer photoresist coating maintains its thickness and conformity with said inter-layer dielectric, thereby preventing electrical shorts between said first and second metal layers and enhancing process fabrication yields.

4,592,133

METHOD OF CONSTRUCTING AN ELECTRICAL TRANSFORMER

Frank H. Grimes, Athens, and Ram R. P. Sinha, Watkinsville, both of Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1985, Ser. No. 717,196
Int. Cl.[4] H01F *41/08*
U.S. Cl. 29—605 10 Claims



1. A method of constructing an electrical transformer, comprising the steps of:

winding a magnetic core from an elongated strip of metallic magnetic material to form a closed, unjointed loop having first and second ends, first and second leg portions each having a rectangular cross-sectional configuration, adjoining yoke portions, an outer surface defined by said leg and yoke portions, and a core window which defines an inner core surface;

winding an electrical conductor about the first leg portion to form a first electrical winding having an opening which defines a circular cross-sectional configuration;

changing the circular cross-sectional configuration of said first electrical winding into a substantially rectangular configuration having winding portions which are closely adjacent to an inner core surface;

winding an electrical conductor about the second leg portion to form a second electrical winding having an opening which defines a circular cross-sectional configuration;

changing the circular cross-sectional configuration of said second electrical winding into a substantially rectangular configuration having winding portions which are closely adjacent to an inner core surface;

winding an electrical conductor about the reformed first electrical winding to form a third electrical winding having a substantially rectangular cross-sectional configuration;

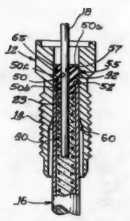
and winding an electrical conductor about the reformed second electrical winding to form a fourth electrical winding having a substantially rectangular cross-sectional configuration.

4,592,134

GLOW PLUG

Frank T. Walton, Shelbyville, Ind., assignor to Wellman Thermal Systems Corporation, Shelbyville, Ind.

Division of Ser. No. 483,365, Apr. 8, 1983, Pat. No. 4,477,717.
This application Jul. 13, 1984, Ser. No. 630,770
Int. Cl.[4] H05B *3/30*
U.S. Cl. 29—611 5 Claims



1. A method of making a glow plug with an outer housing and with a heating element having a sheath with an internal coil with a conductor extending outwardly of the sheath, said method comprising the steps of:

inserting a heating coil into a sheath having a closed end and providing electrically insulating material in the sheath between the coil and the sheath,

inserting a compressible washer with a hole therein into the open end of the sheath and encircling the conductor,

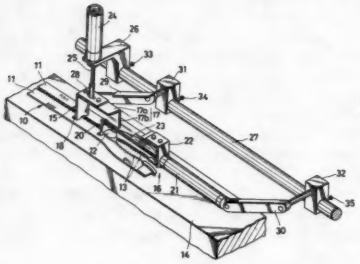
swaging the sheath with the compressible washer therein to reduce the sheath diameter and the diameter of the compressible washer and forcing some of the washer outwardly of the sheath leaving an external washer portion of a diameter at least as great as that of the swaged sheath, and

assembling the sheath to a housing and force fitting the external washer portion against the housing to form an air tight seal therewith to prevent combustion gases from flowing along the interface between the sheath and housing and into the interior of the heating element.

4,592,135
APPARATUS FOR AUTOMATICALLY CLOSING A SLIDE FASTENER

Akiyoshi Kando, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 8, 1985, Ser. No. 731,739
Claims priority, application Japan, May 11, 1984, 59-68675[U]
Int. Cl.[4] A41H *37/06*
U.S. Cl. 29—766 **8 Claims**



1. An apparatus for automatically closing a slide fastener having a slider slidably mounted on two rows of partly interengaged coupling elements supported on stringer tapes along inner longitudinal edges thereof, the apparatus comprising:

(a) a conveyor for carrying the slide fastener along a longitudinal path;

(b) a holder for temporarily holding the slide fastener in a position on said conveyor;

(c) a drive means for moving the slider in a fastener closing direction along the rows of coupling elements to thereby fully close the slide fastener while the slide fastener is held in said position;

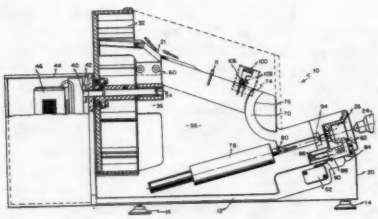
(d) an elongated support frame disposed above said conveyor in parallel relation to the latter and having one end supporting said holder and the other end supporting said drive means; and

(e) an actuator connected to said support frame for reciprocating the latter toward and away from said conveyor to bring said holder into and out of engagement with the slide fastener.

4,592,136
FASTENER PRESENTATION DEVICE

Richard F. Hirsch, Arcadia, Calif., assignor to USM Corporation, Farmington, Conn.

Filed Feb. 14, 1985, Ser. No. 701,924
Int. Cl.[4] B23Q *7/10, 7/12*
U.S. Cl. 29—809 **13 Claims**



1. A device for automatically positioning a fastener in a predetermined, desired disposition and automatically inserting the fastener into an application tool comprising:

a. support means;

b. a housing mounted on said support means for receiving a bulk quantity of fasteners;

c. a vertically disposed rotary drum adapted to receive fasteners from said housing and having means to transport the fasteners upwardly during rotation of said drum;

d. platform means carried on said support means and adapted to receive fasteners from said transport means;

e. chute means coacting with said platform means and adapted to transport the fastener;

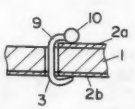
f. a ramp means for receiving the fastener from said chute means and placing the fastener in a predetermined, desired disposition in a feed barrel; and

g. drive means coacting with said feed barrel to automatically insert the fastener into the application tool.

4,592,137
METHOD OF CIRCUIT CONNECTION ACROSS BOTH SURFACES OF SUBSTRATE

Souhei Tanaka, Neyagawa; Kazuhiro Mori, Katano, and Eiji Itemadani, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP83/00417, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02248, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 22, 1983, Ser. No. 638,448
Claims priority, application Japan, Nov. 27, 1982, 57-207914
Int. Cl.[4] H05K *13/04*
U.S. Cl. 29—843 **4 Claims**



1. A method of making a circuit connection between opposite surfaces of a substrate, comprising:

providing a substrate having at least one hole therethrough and having a first electrically conductive member provided around the periphery of said hole on one surface of said substrate and a further electrically conductive member provided around only a part of said hole on the other surface of said substrate;

inserting an electrically conductive wire through said hole and providing a first bent portion on the part of the wire projecting from said one surface in confronting relationship with said first electrically conductive member and providing a second bent portion on the part of the wire projecting from the other surface in confronting relationship with said further electrically conductive member;

providing a first solder having a first melting point only at a position where said second bent portion confronts said further electrically conductive member; and

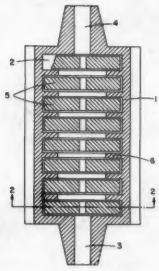
soldering said first bent portion to said first electrically conductive member by a dip method or a flow solder method with a second solder having a melting point at least as high as said first solder and continuing said soldering step until said first solder is fused for soldering said second bent portion to said further electrically conducting member.

4,592,138

METHOD FOR EXAMINING CIRCUIT BOARDS

Tore G. Hesselgren, Borensvägen 1, S-121 68 Johanneshov, Sweden

Filed Feb. 16, 1984, Ser. No. 580,662
Claims priority, application Sweden, Mar. 1, 1983, 8301136
Int. Cl.[4] H05K *3/02*
U.S. Cl. 29—846 **1 Claim**



1. A method of examining the quality of a metal coating within a connection making hole through a circuit board, wherein said method comprises the steps of:

punching at least one disc shaped unit from a printed circuit board, said disc having an accurately centered connection making hole containing said metal coating;

positioning a number of such disc shaped units inside a container in a spaced parallel relationship with their connection making holes aligned, said container having a plurality of internal guides for positioning and securing said discs in said spaced parallel relationship;

filling said container with material for molding the container and the disc shaped units secured therein into a solid block;

milling down the block to a surface in alignment with the centers of the connection making holes of the disc shaped units;

additionally milling down the block at the sides of the holes of the disc shaped units for leaving a longitudinally extending raised central portion around and including said holes; and

polishing the surface of said raised central portion for enabling an examination of the quality of the metal coating within the holes.

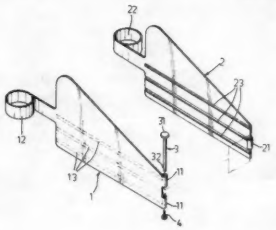
4,592,139

DUAL-PURPOSE CUTTER AND CLIPPER FOR SPONGE CAKE

Judith Huang, Rm. 2D, 6th Fl., No. 183, Chung-Hsaio E. Rd., Sec. 4, Taipei, Taiwan

Filed Jul. 15, 1985, Ser. No. 754,975
Int. Cl.[4] A21C *15/04*
U.S. Cl. 30—114 **1 Claim**

1. A dual-purpose cutter and clipper for sponge cake mainly comprising first flat body, a second flat body and a plug-in pin, in which the first flat body is made of a proper material and in a proper shape, the place close to the upper and lower sides of its one end extends properly and forms a hollow round hole respectively, and its other end extends properly and also forms a convienient holding and using grip handle; the second flat body is a flat body with material and shape identical to those of the said first flat body, the place close to the middle part of its one end extends properly and also forms a hollow round tube, and its other end also extends properly and forms a same grip handle as of that of the said first flat body; a plug-in pin is a hollow cylinder, a plug-in pin cap is provided on its one end, its other end is an inner threaded end; the hollow round tubes provided on one end of the respective said two flat bodies (1), (2) can just mutually match in overlapping upper and lower positions to form a through hollow round tubes, after the said plug-in pin is inserted through the said upper and lower through hollow round tube, then the screw is screwed into the inner threaded end of the said plug-in pin to make the said first and second flat bodies intersect in a proper angle with the said



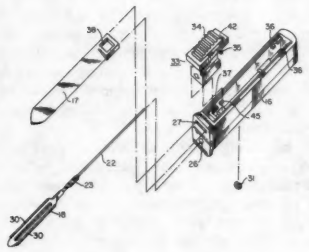
plug-in pin as their axis, and the intersected angle between them can be adjusted freely, further some parallel concave grooves are provided in the inner side surfaces of the said first and second bodies respectively to achieve the object of conveniently, properly, and firmly cutting and clipping the sponge cakes and also maintaining the pleasant eye-catching feeling of the outer appearance of the cakes to the people as the features.

4,592,140

COMBINATION FOOD PEELER AND SLICER

Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Feb. 21, 1985, Ser. No. 703,939
Int. Cl.[4] B26B *11/00*
U.S. Cl. 30—123.7 **11 Claims**



6. A combination food peeler and slicer, comprising:

a handle having a forward end and a rearward end;

a peeler element having (i) a peeler blade disposed outside said handle adjacent the forward end thereof, and (ii) a peeler stem extending into said handle;

peeler stem retaining means operatively associated with said peeler stem and said handle for retaining said stem within said handle while permitting rotation of said stem about the longitudinal axis thereof through a predetermined limited angular range;

a slicer blade having a forward slicing part and a rear part;

slicer blade retaining means operatively associated with said slicer blade and said handle for retaining the rear part of said slicer blade in said handle while permitting sliding movement of said slicer blade in said handle with at least a portion of said forward slicing part of said slicer blade extending outside said handle adjacent the forward end thereof and substantially parallel to said peeler blade;

slicer blade latching means operatively associated with the

rear part of said slicer blade and said handle for detachably securing the rear part of the slicer blade adjacent the rearward end of the handle; and

peeler stem locking means for preventing rotation of said peeler stem about the longitudinal axis thereof only when the forward slicing part of the slicer blade is outside said handle and the rear part of the slicer blade is adjacent the forward end of the handle.

4,592,141

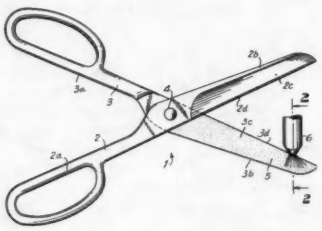
SELF-SHARPENING CUTTING IMPLEMENT AND METHOD OF MAKING THE SAME

Sol Levine, Van Buren Rd., Morristown, N.J. 07960

Filed Oct. 31, 1983, Ser. No. 547,046

Int. Cl.[4] B25F *3/00*

U.S. Cl. 30—138 **1 Claim**



1. A self-sharpening cutting implement, comprising:

a pair of elongated cutting elements each having a gripping portion and a cutting portion, each of said cutting portions having a cutting edge and a substantially planar adjacent surface;

means for so connecting said cutting elements to one another intermediate said gripping and cutting portions thereof for pivoting movement relative to one another about said connecting means and along a common plane that said planar adjacent surfaces extend in said common plane and each of the cutting edges contacts said planar adjacent surface of the respectively other of said cutting element at least in a part of the trajectory of relative pivotal movement thereof; and

a film-like honing layer constituted of a settable mixture of epoxy and grit, said honing layer being adhered on one of said planar adjacent surfaces and constituting an integral and a permanent portion of said one planar adjacent surface, said honing layer extending from said cutting edge of said one planar adjacent surface and co-extensive therewith along said common plane across said cutting element having said one planar adjacent surface, said honing layer being operative for abrading and sharpening said cutting edge of the respectively other of said cutting elements during the movement thereof in said part of said trajectory.

4,592,142

GUARD DEVICE FOR HEDGING SHEARS, AND HEDGING SHEARS

Albrecht Schnizler, Nürtingen, Fed. Rep. of Germany, assignor to Metabowerke GmbH & Company, Nürtingen, Fed. Rep. of Germany

Continuation of Ser. No. 527,623, Aug. 29, 1983, abandoned. This application May 29, 1985, Ser. No. 739,482

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231899

Int. Cl.[4] B26B *19/04*

U.S. Cl. 30—210 **8 Claims**

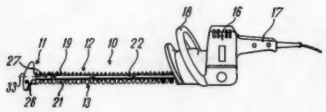
1. Hedging shears, comprising:

a housing;

drive means mounted to the housing;

two cutting bars arranged parallel to each other, with at least one of said cutting bars being driven by said drive means to produce reciprocal movement between the cutting bars, and with both cutting bars being provided with opposed cutting teeth, defining cutting lines between adjacent pairs thereof, said driven cutting bar defining a leading end of the hedging shears as a function of the stroke generated by the reciprocal movement; and

a plate-like guard element connected to the housing and extending parallel to the cutting bars and outwardly of the



leading end of the hedging shears, said plate-like guard element being wider than the width of the cutting bars and having at its leading end a shoe-like shaped portion with a rounded leading skid face, the guard element further having rear flank faces at the rear side of the shoe-like shaped portion, said rear flank faces extending on both sides of the cutting bars and as far as the vicinity of a cutting line, said guard element comprising a guard cap defining a cavity which accommodates the leading cutting teeth of each movable cutting bar, wherein:

one of said cutting bars is stationary; and

the guard element is fastened to said stationary cutting bar.

4,592,143

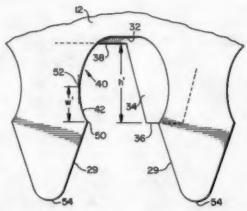
RECIPROCATING TRIMMING APPARATUS

Russell Pizzuto, 332 Holly Rd., and Alfred Schiazza, III, 608 Hardin St., both of Easton, Md. 21601

Filed Apr. 6, 1984, Ser. No. 597,736

Int. Cl.[4] B26B *19/02*

U.S. Cl. 30—216 **15 Claims**



1. In apparatus for trimming hedges, shrubs and the like, of the kind having two parallel elongated cooperating members, a first of said members having a plurality of slots each having a closed end and an open end, and being oriented generally perpendicular to the axis of elongation for guiding the individual stems of the plant to be trimmed, the second member having a plurality of blades each having a tip and being oriented generally perpendicular to the axis of elongation for shearing the stems upon linear reciprocation of one of the members relative to the other along the respective axis of elongation, and means positioned at one end of the recirpocating member for effecting the reciprocation, the improvement comprising:

means associated with said first member for capturing the stems by resisting movement of the guided stems in the direction of the slot open end upon contact by the blades, said stem capturing means including recesses formed in the edges of the first member which define the slots, said recesses having acute recess portions presenting acute stem contact angles to the guided stems, said contact angle

being measured from the axis of elongation to tangents to the edge defining the acute recess portion, said contact angle decreasing to a predetermined minimum along said edge in said direction of the slot open end, and wherein each of said acute recess portions extends from about the location of the blade tip inward toward and closed end of the slot a distance at least about 50% of the effective blade height, each of the plurality of blades having a cutting edge at an angle to said axis of elongation, and wherein the predetermined minimum contact angle is less than said cutting edge angle.

4,592,144

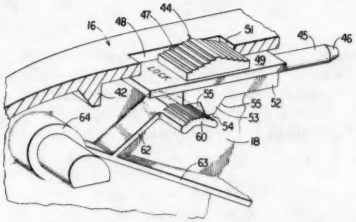
MOLDED SCROLLER SAW LOCK BUTTON SPRING

Richard R. Tolbert, Easley, and Troy L. McCurry, West Union, both of S.C., assignors to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 622,410, Jun. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 518,784, Jul. 29, 1983, abandoned. This application Dec. 12, 1985, Ser. No. 808,232

Int. Cl.[4] B25F *5/02*

U.S. Cl. 30—394 **3 Claims**



1. For a powered hand tool having a plastic housing for holding operating components thereof, and a plastic cover for enclosing said components in said housing, said hand tool having a slide button guided for linear movement relatively to said housing and cover, a detent arrangement providing tactile and audible indication of actuation of said slide button, said detent arrangement comprising:

an inwardly extending projection on said slide button, said projection being formed with first and second oppositely disposed taper sides extending toward each other and each terminating in a juncture with a flat base portion, and a plastic spring extending cantilevered lateraly adjacent said projection from a selected one of said cover and said housing and molded as a part thereof, a selected one of said housing and said cover including abutment means defining for said slide button first and second opposite extreme positions of linear movement, said plastic spring having a first arched surface extending beneath said slide button projection in all positions of said slide button between said first and second extreme positions, said plastic spring first arched surface being contiguous with only the juncture of said flat base portion and said first tapered side of said slide button projection in the first extreme position of said slide button, and contiguous with only the juncture of said flat base portion and said second tapered side of said slide button projection in the second extreme position of said slide button, whereby shifting said slide button from any one to the other of said first and second positions will cause deflection and snap back of said plastic spring to provide a detent for said slide button and acceleration of said slide button induced by changing angle of contact of said arched spring surface with the juncture of said flat base portion with said tapered sides to produce an audible indication of the attainment of the selected position upon impact of said slide button with said abutment associated with said selected position.

4,592,145

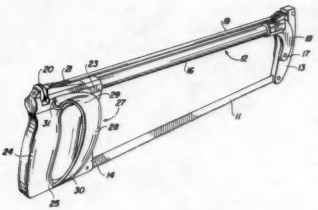
HACKSAW HAND GUARD

Peggy S. Egan, and Daniel J. Egan, both of P.O. Box 1341, Dewey, Ariz. 86327

Filed Dec. 7, 1984, Ser. No. 679,365

Int. Cl.[4] B27B *21/02*

U.S. Cl. 30—507 **6 Claims**



1. The combination with a hacksaw comprising a frame having forward and rear posts, a saw blade tensioned between said posts, and a pistol grip-like handle disposed rearwardly of said rear post and having its upper end connected to an upper region of said rear post, of a hand guard adapted to be secured to said rear post for preventing the user's hand from contacting a workpiece, said guard having its main portions extending outwardly and rearwardly from said rear post, but terminating ahead of said handle to facilitate gripping the handle.

4,592,146

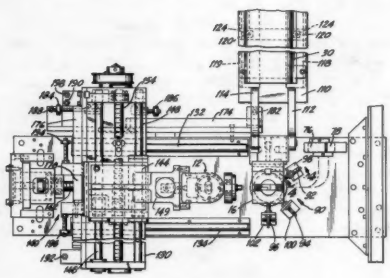
TOOL PRE-GAUGING DEVICE

Michael E. Campbell, Farmington Hills, Mich., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 591,356, Mar. 20, 1984. This application Oct. 9, 1984, Ser. No. 658,490

Int. Cl.[4] B27G *23/00*

U.S. Cl. 33—185 R **6 Claims**



1. A device for pre-gauging cutting tools to ascertain their offsets in two directions relative to a master cutting tool comprising:

means for releasably holding a cutting tool to be gauged;

sensing means for determining whether a cutting tool is present, clamped, or unclamped in the cutting tool clamping means;

means for reading an identification code on the cutting tool while the tool is in the cutting tool clamping means;

electronic gauging means movable to the gauging position for measuring the offsets between the master tool and the cutting tool;

means for advancing and retracting the electronic gauging means from a first home position to a gauging position along a first axis; and

means for advancing and retracting said electronic gauging

means from a second home position to a gauging position along a second axis perpendicular to the first axis.

4,592,147

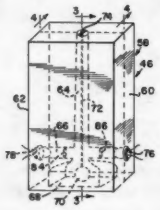
ELECTRICALLY ACTUATED ANGULAR ORIENTATION INDICATING DEVICE

Robert D. Herman, 4720 S. Greenwood, Chicago, Ill. 60615

Continuation-in-part of Ser. No. 651,675, Sep. 18, 1984, which is a continuation-in-part of Ser. No. 499,345, May 31, 1983, abandoned. This application Sep. 27, 1984, Ser. No. 654,867

Int. Cl.[4] G01C 9/06

U.S. Cl. 33—366 **15 Claims**



1. A device for indicating a desired predetermined angular orientation, said device comprising, in combination:

a liquid filled chamber having an upper portion, a lower portion, a first side portion, and a second side portion;

a radiated beam path extending from said first side portion to said second side portion;

means for emitting a beam along said beam path from said first side portion to said second side portion;

means at said second side portion for receiving said emitting beam;

means of a size equal to said emitted beam for blocking said beam path for preventing said radiated beam emitted by said emitting means from being received by said receiving means, said blocking means being swingingly suspended from a connecting portion of said upper portion of said chamber;

electric powered indicating means actuatable in response to said blocking means blocking said beam path for maintaining said receiving means out of radiated beam communication with said emitting means; and

said beam path and said connecting portion of said upper portion of said chamber from which said blocking means is suspended being arranged in a desired relationship with respect to each other whereby when said blocking means maintains a stable position blocking said beam path said chamber is in a desired, predetermined angular orientation and said electric powered indicating means produces an electrical output in response to said beam being blocked.

4,592,148

CHALK LINE REEL STRUCTURE

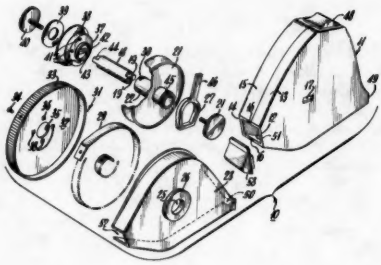
Paul Longenette, 330 N. Zane Hwy., Martins Ferry, Ohio 43935

Filed Jul. 12, 1984, Ser. No. 630,375

Int. Cl.[4] B65H 75/48

U.S. Cl. 33—414 **6 Claims**

1. A chalk line reel structure comprising a reel having a chalk line wound thereon, a closed housing surrounding said reel and having an opening through which said line extends, a central shaft rotatably carrying said reel, spring means on one side of said housing and fixed at one end relative to said reel, an enclosure enclosing said spring means with the other end of said spring means secured to said enclosure, adjustable ratchet means coupling said housing and enclosure to impart the desired tension to said spring when said chalk line is in the retracted position, clutch means carried by said housing and operable to lock said reel with the line in a selected extended position and to control the rate of return of said line under the action of said spring means, said housing being formed of two spaced plates with a peripheral wall closing the space defined by said plates, means fixedly keying said shaft to one of said plates, said reel including a sleeve fixed thereto for rotatably engaging said shaft, said other plate having a central opening through which said sleeve extends, said one end of said spring being fixed to said sleeve and said ratchet means couples said enclosure to said shaft, said clutch means includes a braking member for engaging said sleeve, a lever arm connected to said



braking member and a brake actuating member secured to the lever arm and operable to gradually apply said brake to control rotation of said reel upon retraction of said chalk line and to hold said brake in a reel locking position, a reel enclosing compartment within said housing and having a sleeve receiving opening, said compartment having a chalk line opening in alignment with the first said housing opening and said housing and compartment each include second aligned openings for feeding powdered chalk to said chalk line and means for closing said second openings.

4,592,149

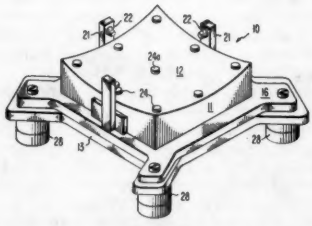
APPARATUS FOR VERIFYING THE ACCEPTABILITY OF THE CURVATURE OF A CURVED OBJECT

Gerald R. Long, Lititz, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1985, Ser. No. 724,630

Int. Cl.[4] G01B 7/28

U.S. Cl. 33—550 **2 Claims**



1. Apparatus for verifying the acceptability of the curvature of a curved article after a processing step comprising:

a fixed member having substantially straight sides and a curved surface configured to conform with the curvature of said article;

a plurality of article sensors spaced along and embedded in said surface whereby said sensors engage an article placed on said surface, said sensors being biased to normally extend beyond said curved surface whereby said article depresses said sensors into said curved surface and said

sensors remain in engagement with said surface when said article is moved away from said curved surface;

a movable support frame arranged about said fixed member, said support frame being bilaterally movable in directions substantially parallel to said sides whereby an article is displaced from, or engaged with, said surface in response to movement of said frame;

article support means affixed to said support frame at positions about said fixed member, said support means being adapted to support an article whereby said article engages said surface during a processing step and whereby said article is removed from engagement with said surface by movement of said frame after said processing step, said sensors remaining in contact with said article after said movement whereby said sensors detect any deformation in the curvature of said article after said processing step;

a peripheral recess in the periphery of said fixed member, a portion of said frame extending into said recess, said frame being spaced a preselected distance from said recess whereby said movement is restricted by said recess; and

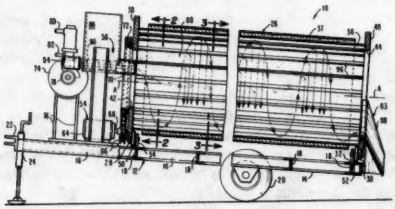
means for moving said frame.

4,592,150

GRAIN ROASTING DRUM CONSTRUCTION

Dale L. Schnupp, Lebanon, Pa., assignor to Schnupp's Grain Roasting, Inc., Lebanon, Pa.

Filed Apr. 25, 1985, Ser. No. 727,319
Int. Cl.[4] F26B *11/04*
U.S. Cl. 34—136 **1 Claim**



1. An elongated hollow drum for use in a machine for roasting grain, comprising:

(a) a plurality of elongated, generally flat plates each having a pair of spaced opposite longitudinal edges, said flat plates being arranged edge-to-edge in an endless succession with an edge of one flat plate rigidly connected to an edge of the succeeding flat plate so as to form a ring-like structure which defines a continuous sidewall of said drum having an exterior, a hollow interior, a central longitudinal axis and respective opposite ends;

(b) a plurality of elongated flanges each connected along one of said edges of each of said flat plates and extending toward said central axis so as to define a grain carrying vane disposed in said interior of said drum sidewall, said each flange being of a generally shallow vee-shaped configuration in cross-section;

(c) a sheath of insulation encasing said continuous sidewall of said drum about said exterior thereof; and

(d) a pair of annular end plates attached to said sidewall of said drum at said respective opposite ends thereof for defining openings at said opposite ends of said sidewall of said drum to the interior thereof and peripheral circular end edges on said drum extending radially outwardly of said sidewall for facilitating rotation of said drum;

(e) said each of said flat plates together with one of said flanges having an integrally-formed one-piece construction with said flange being bent with respect to said flat plate;

(f) one of said pair of spaced opposite edges of said each flat plate being an angle edge defined by said integral connection between said flat plate and its said flange and the other of said pair of spaced opposite edges of said each flat plate being a teminal edge;

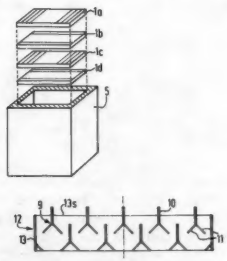
(g) said terminal edge of each flat plate in said endless succession thereof being rigidly connected by welds to said angle edge of each next flat plate in said endless succession thereof in thereby forming said ring-like structure.

4,592,151

PACKING ELEMENTS FOR DEVICE FOR COUNTERCURRENT EXCHANGE, PARTICULARLY HEAT EXCHANGE, BETWEEN SOLID PARTICLES AND A GAS CURRENT

Georges Meunier, Nice, France, assignor to Tunzini-Nessi Entreprises d'Equipments, Argenteuil, France

Filed Aug. 6, 1984, Ser. No. 637,787
Claims priority, application France, Aug. 4, 1983, 83 12844
Int. Cl.[4] F26B *17/14*
U.S. Cl. 34—168 **18 Claims**



1. A column for directly contacting a gas current moving in a first vertical direction with solid particles circulating countercurrent thereto in said first vertical direction, said column including packing stages each comprising

at least two stacking elements, superimposed upon one another in said first direction, each of said stacking elements occupying the entire inner section of said column; and

a plurality of shaped elements in each of said stacking elements, said shaped elements for each said stacking element comprising at least two ribs forming therebetween an angle sufficient to change the direction of gas and solid particles impinging thereon and being aligned in rows and regularly spaced transverse to said first direction, said spacing being such that said shaped elements of each said stacking element overlap one another to form a screen covering said entire inner section of said column when seen along said first direction, said spacing also being such as to form a passage for said solid particles, said passage being between 3 to 20 times the average grain size of said particles.

4,592,152

UNLASTED SHOE

Robert L. Wright, St. Louis County, and Donald W. Zeuschel, St. Louis, both of Mo., assignors to Brown Group, Inc., St. Louis, Mo.

Filed May 20, 1985, Ser. No. 735,683
Int. Cl.[4] A43B *3/12*
U.S. Cl. 36—11.5 **2 Claims**

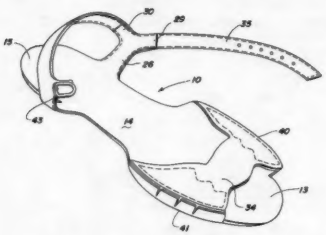
1. A shoe upper construction comprising:

(a) an elongated blank having heel, instep and toe areas, with said toe area having integrally formed vamp tabs along each side of the blank separated at a plurality of spaced places, said vamp tabs having lengths sufficient to enclose the side of a foot and individual outer ends that collectively conform to the marginal shape of the sides of said toe area and said tabs adjacent said instep area having

margins angularly directed relative to the longitudinal axis of said blank;

(b) quarter tab means projecting from each side of said blank between said heel and instep areas, each quarter tab having angularly directed temianl ends, one branching forwardly and angularly outwardly of the instep area and another branching rearwardly and angularly outwardly of said heel area;

(c) vamp means having a body portion with opposite side margins for attachment to said individual vamp tabs at the sides of said toe area, the contour of said vamp side margins being shaped such that the dimension across the width adjacent the toe area is less than the dimension across the width adjacent the instep area whereby upon



being secured to said vamp tabs in cooperating positions said vamp means is caused to be shaped transversely of said toe area into an arch substantially conforming to the foot of the wearer, and said tabs adjacent said instep area having said angularly directed margins directed to approach said vamp means for effecting a gap free fit;

(d) back strap means having its ends connected to said terminal ends of said quarter tabs that are branching alongside said heel area;

(e) instep strap means having one end connected to a terminal end of one of said quarter tabs that branches alongside the instep area; and

(f) means carried by the terminal end of the other quarter tab means that branches alongside the instep area for engaging said instep strap by its opposite end.

4,592,153

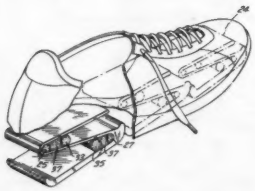
HEEL CONSTRUCTION

Jose-Maria Jacinto, 429 E. 52nd St., New York, N.Y. 10022

Filed Jun. 25, 1984, Ser. No. 622,441

Int. Cl.[4] A43B *21/30*

U.S. Cl. 36—38 **21 Claims**



1. A heel construction capable of providing an optimal response for an individual wearing a shoe to which it is attached and adaptable to being permanently or detachably fixed to a shoe having an upper section and a sole section attached to said upper section, both of said sections extending in a generally horizontal direction and forming a toe area at one end and a heel area at the opposite end, the heel construction comprising at least one generally Z-shaped resilient plate having upper, middle and lower arms, the upper arm of said plate extending towards the toe area of a shoe to which said heel construction is fixed, the lower arm of said plate extending towards the periphery of the heel area at the opposite end of said shoe and at least one supporting shaft disposed in a transverse direction between the upper arm and the middle arm and at least one supporting shaft disposed in a transverse direction between the lower arm and the middle arm of the Z-shaped plate at the junctures of said upper and lower arms with said middle arm.

4,592,154

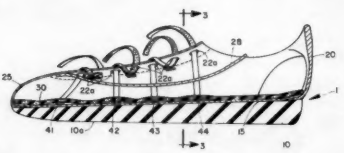
ATHLETIC SHOE

Donald S. Oatman, 6122 Patrick Henry, San Antonio, Tex. 78233

Filed Jun. 19, 1985, Ser. No. 746,569

Int. Cl.[4] A43B *11/00*

U.S. Cl. 36—114 **10 Claims**



1. An athletic shoe comprising in combination a sole and a flexible upper secured to the sole, said upper including a slot lengthwise aligned relative to the medial portion of said sole, said upper having a plurality of apertures spaced along each side of said slot; a flexible innersole mounted in said upper in overlying conforming relation to said sole with at least the forward portions thereof being unsecured to said sole; and a plurality of elongated pliant fastening bands, the central portions of said bands respectively passing transversely under said unsecured forward portions of said insole in lengthwise spaced relation; and the end portions of said bands passing outwardly through said apertures, whereby securing said end portions of each band together concurrently pulls together the opposed slot sides of the upper and pulls lengthwise spaced portions of the forward portions of said insole upwardly and inwardly into snug engagement with the bottom and adjacent side portions of an inserted foot.

4,592,155

DREDGER WITH TRANSPORT BASIN HAVING LOADING AND UNLOADING MECHANISM

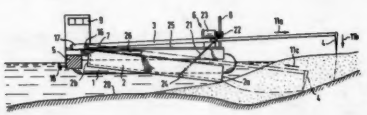
Antero Mustonen, Kuopio, Finland, assignor to Oy Wärtsilä AB, Helsinki, Finland

Filed Sep. 10, 1984, Ser. No. 649,553

Claims priority, application Finland, Sep. 20, 1983, 833352

Int. Cl.[4] E02F *5/28, 3/04*

U.S. Cl. 37—54 **18 Claims**



1. A dredger comprising a hull structure, flotation means for supporting the hull structure at the surface of a body of water, an elongate transport basin for receiving material lifted from the bottom of the water body and being open at the top and at at least one end, means supporting the transport basin movably with respect to the hull structure so that at least said one end of the transport basin can be lowered to the bottom of the water body for receiving material from a dredged area and can

be raised up to a transport position in which the dredger can be moved to a discharge location for discharging material from the transport basin, a digger plate, a power transmission member mounted on the hull structure and connected to the digger plate, and power means connected to the power transmission member for moving the digger plate within the basin in one direction for drawing material from the dredged area into the transport basin by way of the open end thereof when the transport basin is in its lowered position, and for moving the digger plate in the opposite direction to push material from the transport basin by way of said open end for unloading the dredger.

4,592,156

SNOWBLOWER

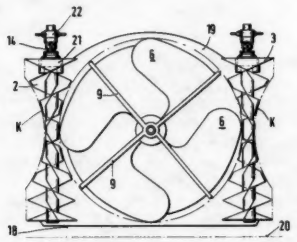
Alfred Schmidt, Bernau, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt GmbH, Blasien, Fed. Rep. of Germany

Filed Jun. 24, 1985, Ser. No. 748,103

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1984, 3424236

Int. Cl.[4] E01H *5/09*

U.S. Cl. 37—250 **6 Claims**



1. A snowblower comprising

a blower wheel (4) with a horizontal rotational axis running in the direction in which snow is being cleared;

a precutting device (8) which rotates about the same rotational axis and is disposed in front of the blower wheel in the snow clearing direction; and

snow-clearing worm gears (2,3) which rotate about vertical axes and are disposed on both sides in front of the blower wheel; characterized in that

the precutting device (8) has radial cutting arms (9) each with a radius corresponding approximately to the radius of the blower wheel (4); and

the rotational bodies formed by the precutting device (8) and the worm gears (2, 3) are tailored to one another, at least as seen from the top, so that the respective rotating parts interact with one another without contact.

4,592,157

VEHICLE IDENTIFICATION AND RETRIEVAL SYSTEM

Charles J. Kerr, 605 S. Barrington, Los Angeles, Calif. 90049

Filed Oct. 22, 1984, Ser. No. 663,225

Int. Cl.[4] A44C *3/00*

U.S. Cl. 40—2 A **1 Claim**

1. A method for the use of an identification and retrieval system for vehicles comprising the the use of:

a first identification means,

a second identification means, and

a third identification means

wherein the first and third identification means are constructed from a magnetic material with the second identification means being constructed from a non-magnetic material and further wherein the first identification means includes a connector element wherein when not in use the first, second and third identification means are stored in a layered configuration with the second identification means being held between the first and third identification means which are held in a contacting layered relationship by the magnetic force emitted by the first and third identification means and further wherein the system is utilized by transferring the second identification means to the driver of the vehicle to be identified and retrieved, then parking the vehicle, removing the vehicle's keys and attaching the first identification means to the vehicle's keys by means of the connector element, and then placing the third identification means on the outer body of the parked vehicle and storing the

connected first identification means and vehicle keys until the return of the vehicle's driver, then retrieving the second identification means from the vehicle driver, retrieving the first identification means and keys from storage, locating the vehicle by the third identification means, removing the first identification means from the keys, removing the third identification means from the vehicle and placing the first, second and third identification means in the layered configuration.

4,592,158

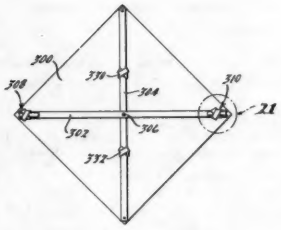
ROLL-UP SIGN WITH ATTACHMENT STRIPS

James R. Seely, Farmington, Conn., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 623,622, Jun. 22, 1984, Pat. No. 4,507,887, which is a continuation of Ser. No. 498,804, May 27, 1983, abandoned. This application Dec. 31, 1984, Ser. No. 688,067

Int. Cl.[4] G09F *17/00*

U.S. Cl. 40—603 **15 Claims**



1. In a sign assembly including a sign panel and at least one support member for supporting said panel in a generally planar configuration, the improvement comprising mounting means for releasably mounting said sign panel on said support member, said mounting means including a first strap member secured to said sign panel and being positionable over at least a portion of said support member, said first strap member being secured to said sign panel at a generally peripheral portion thereof and generally disposed on a first side of said support member, said first strap member being situated around an end portion of said support member for attachment to a second side of said support member, first releasable fastener means for releasably attaching said first strap member to said support member, said first fastener means being subjected primarily to shear loading when said sign panel is subjected to wind forces exerted generally in a direction such that said wind forces tend to separate said sign panel from said support member, a second

strap member having two ends and secured to the sign panel, and second releasable fastening means for releasably connecting together the two ends of the second strap member around said support members.

4,592,159

DEVICE FOR SIGNALING

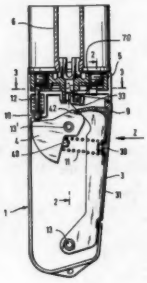
Hanns-Juergen Diederichs, Jr., Grande, Fed. Rep. of Germany, assignor to NICO-PYROTECHNIK Hanns-Juergen Diederichs GmbH & Co. KG, Trittau, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,669

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301683

Int. Cl.[4] F41C *3/02*

U.S. Cl. 42—1 Z 11 Claims



1. An improved signaling device for firing a cartridge having a grip and a cartridge magazine rotatably mounted on the grip, the improvement comprising

(a) a grip portion having triggering means which include a firing lever and an actuating surface, whereby when said grip portion is naturally manually held the longitudinal axis of the magazine is oriented substantially vertically;

(b) said cartridge magazine is detachably mounted on said grip portion and the firing direction thereof is oriented vertically upwardly so as to be parallel to the vertical longitudinal axis of the magazine, and

(c) a hammer having a stepped surface which is rotatably mounted in said grip portion, a firing pin slidably mounted in said grip portion, first biasing means urging said firing pin into engagement with said hammer, said firing lever including an inwardly projecting claw which opertively engage the stepped surface of the hammer in such a way that upon pressing the claw inwardly via the actuating surface the hammer is rotated so as to be initially lifted off an engagement with said firing pin until said claw slides past said stepped surface.

4,592,160

HANDGUN MAGAZINE WITH POMMEL BASE

Robert Bross, Ballville Rd, Bolton, Mass. 01740

Filed Oct. 10, 1984, Ser. No. 659,329

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] F41C *25/00*

U.S. Cl. 42—7 12 Claims

1. Means for attaching a pommel to a cartridge magazine assembly which is slideable into a recess in a butt end of a grip of a handgun, the magazine having a cartridge discharge end and a base,

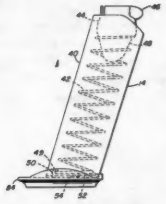
the pommel having a face engageable with the base of the magazine assembly,

a floor forming part of the face,

a plateau rising above the floor,

slots formed in the plateau,

complementary flanges on the base of the magazine assembly engageable with the slots in the plateau to join the pommel and magazine assembly together; and,



means to releasably interlock the magazine assembly and pommel when in assembled relationship.

4,592,161

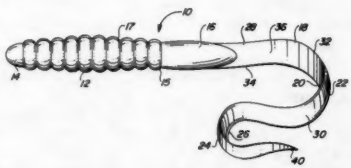
SOFT PLASTIC FISHING LURE

H. Wayne Smith, 5050 Charlemagne La., Jacksonville, Fla. 32210; Mark W. Smith, 3339 Waverly Dock Rd., Mandarin, Fla. 32064, and James O. Ising, 2594 Franklin Ct., Orange Park, Fla. 32073

Filed Aug. 6, 1984, Ser. No. 637,980

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.24 13 Claims



1. A fishing lure comprising:

(a) a generally cylindrical body of pliable plastic defining a forward end toward the desired direction of travel and a rearward end;

(b) a soft plastic tail extending from said rearward end of said body as a substantially flat ribbon, said flat ribbon tail molded into a curved, generally "S" configuration in the plane of said flat ribbon, said "S" configuration defined by:

(1) a first portion extending from said rearward end and generally parallel to the axis of said body portion;

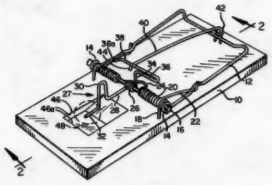
(2) a second portion forming a first, approximately 180 degree curve in said flat ribbon and curving laterally away from said first portion; and

(3) a third portion forming a second, approximately 180 degree curve in said flat ribbon and curving laterally away from said second portion, said third portion terminating in the tip of said tail, the curve of said second and third portions having shorter and longer arc pairs, the shorter arc in each pair tends to extend straight during movement of said lure through water and the longer arc in each pair tends to curl against the flow of water to thereby create turbulence, while said second arc pair causes drag to reduce spin.

4,592,162
RODENT TRAP WITH GUARD MEANS

Arvo J. Hallback, 704 NE. 71st Ave., Portland, Oreg. 97213

Filed Jul. 13, 1984, Ser. No. 630,679
Int. Cl.[4] A01M *23/29, 23/30*
U.S. Cl. 43—81 4 Claims



1. A rodent trap comprising
a base having forward and rearward ends and opposite sides,
a transverse shaft secured to the base intermediate the ends thereof,
a U-shaped jaw member spring loaded on said shaft for pivotal movement between a spring loaded rear set position and a rodent engaging forward position,
a holding lever pivotally mounted adjacent the rear of said base and arranged to extend forwardly over said jaw member to hold the latter in its set position,
a trigger mechanism pivotally supported on said base,
a forwardly extending bait bar on said trigger mechanism arranged to be associated with a bait to hold said trigger mechanism in a pivoted position such that said holding lever is arranged to hold said jaw member in a set position,
a wire-like finger extending upwardly at the rearward end of said bait bar and from an intermediate portion between the sides of said base member,
said finger extending above said shaft and having a transverse extension on the upper end thereof which projects in opposite directions spanning a major portion of the distance between said opposite sides of the base to form guard means on said trigger mechanism disposed rearwardly of said bait bar and at a height substantially above said shaft to discourage a rodent from travelling to the bait bar from a rearward position over the trap,
one of said transverse extensions comprising a catch portion and having a free end allowing said holding lever to be moved thereunder from the side for engaging said catch portion to hold said jaw member in its releasable set position.

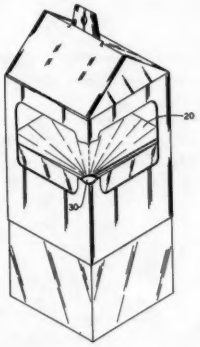
4,592,163
TELESCOPING CARTON AND INSECT TRAP

Donnie S. Wilson, Burlington, N.C., assignor to Mebane Packaging Corporation, Mebane, N.C.

Filed Jun. 28, 1985, Ser. No. 749,727
Int. Cl.[4] A01M *1/20;* B65D *5/35*
U.S. Cl. 43—122 8 Claims

1. A rectangular parallelepiped, collapsible, multipurpose carton comprising:
(a) an inner, container member having top, bottom and side walls formed from a single integral blank; said side walls comprising a plurality of rectangular panels joined along hinge lines at each side edge to corresponding side edges of adjacent panels; said bottom wall being comprised of a first plurality of inwardly folded, overlapping panels joined along hinge lines at the top edges thereof to corresponding bottom edges of said side walls; said top wall comprising a funnel formed of a second plurality of overlapping panels joined along hinge lines at the bottom edges thereof to corresponding top edges of said side walls; said second plurality of overlapping panels, when folded to an erect position, forming said funnel;
(b) an outer, cover member having side walls, an open bottom, and a closed top and being formed from a single blank having a plurality of hingedly connected panels; said cover being slidably mounted over the funnel end of said container member; said cover being movable from a first closed position fully overlying said container member, to a second extended or open position overlying only a portion of said inner member;
(c) said cover member further including at least one opening in a side wall adjacent the upper end thereof for access to or inspection of said funnel of said container when said outer cover member is in the second extended position.

6. A disposable trap for flying insects including:
(a) a two-part, telescopically engaged housing having a first, inner container member with a second, outer cover member slidably mounted thereover;
(b) said inner container having a closed bottom, adjoining side walls, and a funnel-shaped, substantially closed top;



said funnel top having an opening at the bottom thereof for insects to enter therethrough;
(c) said outer member including an open bottom for receiving said inner container, adjoining side walls, and a closed top; at least one of said side walls including a window therein serving as an entry port for flying insects;
(d) said outer cover member being movable from a first closed position fully overlying said inner container, to a second open or extended position overlying only a portion of said inner member;
(e) locking means for selectively retaining said cover in said second position;
whereby flying insects are attracted to a lure contained within said inner container and trapped therein, and upon filling said inner container, said outer cover is pushed to said closed position and said trap is discarded.

4,592,164
HERBICIDE APPLICATOR

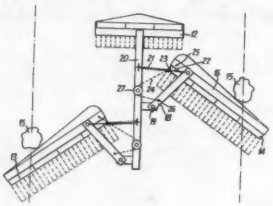
Patrick J. M. Ballu, Reims, France, assignor to Tecnoma, France

Filed Nov. 3, 1982, Ser. No. 438,739
Claims priority, application France, Nov. 4, 1981, 81 20653
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—1.5 16 Claims

1. A device for treating cultivated plants with liquids by contact moistening comprising:
a tubular container receiving said liquid, said container having a longitudinal axis, and a longitudinal slot on a lower surface thereof, said axis being horizontally disposed during use;
a plurality of soft, flexible flat wicks comprised of braids of woven fibers, and having ends tightly confined in a side-by-side relationship in said longitudinal slot, said wicks having a predetermined length to permit said wicks to

spread over a substantial portion of said length over said plants;

spray nozzle means for spraying said liquid on said wicks, from said container, said spray nozzle means being disposed on said container closely adjacent to said end wicks contained in said longitudinal slot and remote from said



wicks portion that spreads over said plants said nozzle means directed toward said portions of said wicks adjacent said slot; and

pump means coupled to said nozzle means for pressurizing said fluid and supplying it to said nozzle means including means for providing an intermittent flow of said pressurized fluid in metered amounts to said nozzle means.

4,592,165

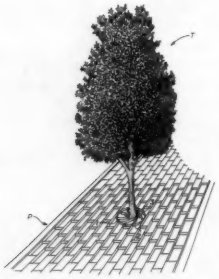
TREE GRATE

Thomas E. Sisk, 7815 Antoine, Houston, Tex. 77088

Filed Mar. 12, 1984, Ser. No. 588,812

Int. Cl.[4] A01G *17/00*

U.S. Cl. 47—25 **8 Claims**



1. An improved grate for protectively surrounding the base of a tree while allowing water to reach the soil in which said tree is planted and permitting pedestrian traffic therearound, comprising:

a support ring for surrounding said tree at a radially spaced distance therefrom; and

a series of spirally disposed resilient members the proximal ends of which are affixed to said support ring and the distal ends of which generally define an opening base, said distal ends of said resilient members being free to move radially toward said ring in a common plane therewith in response to radial forces applied thereto to allow radial expansion of said opening in response to the radial growth of said tree so as to provide continuous surfaces for pedestrian traffic around said tree in said common plane.

4,592,166

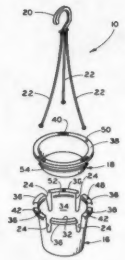
MULTIPLE SECTION HANGING PLANTER

Donald L. Tendrup, 32 DelMarie La., Nesconset, N.Y. 11767, and Joseph P. Devito, 7 Ingrid Ct., Hauppauge, N.Y. 11729

Filed Sep. 4, 1984, Ser. No. 646,798

Int. Cl.[4] A01G *9/02*

U.S. Cl. 47—67 **2 Claims**



1. In a multiple section hanging planter of the type having a lower section with notches providing side openings for the growth of plants therefrom extending radially of said planter through said side openings and an upper section in superposed relation on said lower section bounding an upper opening for the growth of additional plants therefrom extending vertically of said planter through said upper opening, the improvement to said planter comprising said lower section being formed with a wall that extends upwardly beyond said side openings therein so as to bound a compartment above said radially extending plants, and said upper section being formed with a wall that is disposed telescopically within said compartment when said upper section is assembled onto said lower section, said walls of said upper and lower sections overlapping each other and having thereon a cooperating pair of projections extending in opposite directions between said upper and lower sections, said projection on said upper section being below that of said lower section so that disassembly of said sections requires camming movement of said lowermost projection over said other projection against the weight of any earth used for said growth of plants being exerted radially against said overlapping walls of said upper and lower sections to thereby contribute to preventing said disassembly from occurring inadvertently, and on said lower section a horizontally extending lip bounding an opening and facing into said compartment, and said upper section being of pliable material and having an inverted downwardly facing U-shaped horizontally oriented lip bounding said upper opening, said U-shaped lip sized and of sufficient pliability so as to cooperatively snap in a friction fit over said lip of said lower section, to thereby contribute to further preventing inadvertent disassembly of said sections.

4,592,167

DOORS

Emile Andrawos, Seacliff Park, Australia, assignor to Combi Door Australia Pty. Ltd., St. Marys, Australia

Filed Feb. 14, 1984, Ser. No. 580,139

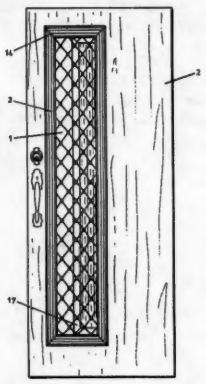
Claims priority, application Australia, Oct. 28, 1983, 20810/83

Int. Cl.[4] E06B *7/28*

U.S. Cl. 49—171 **3 Claims**

1. A solid door having a ventilating closeable security aperture therethrough, an insert comprising an outer frame to be fitted to the aperture to pass into the aperture, an inner frame to be fitted to the aperture on the inside of the door, said outer frame having secured thereto a security grille and adjacent thereto an insect screen to both cover said aperture, said outer frame and said inner frame each having a leg to protrude into the aperture in overlapping relationship, means for fastening

said legs together to lock said frames to the said door, a sliding panel slidable on tracks on the inside of the door to close said



aperture, and sealing means to seal the sliding panel to the inner frame when in the closed position.

4,592,168

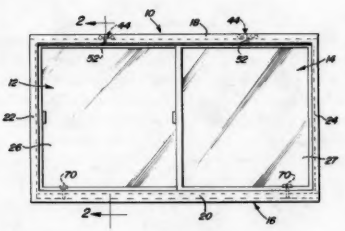
SLIDING AND PIVOTAL WINDOW

Ernest F. Struckmeyer, 1261 S. Mayfair, Daly City, Calif. 94015

Filed Jul. 12, 1984, Ser. No. 630,428

Int. Cl.[4] E05D *15/22*

U.S. Cl. 49—177 **6 Claims**



1. A sliding window structure comprising at least one window element mounted in a support frame having top and bottom track members, at least one of which track members includes elongate guide means for receiving the window element and guiding same for lengthwise sliding along the frame, wherein said one track member includes screw adjustment means for moving the track member toward and away from an adjacent horizontal support frame member between positions wherein the guide means respectively receives the window element for guided sliding movement along the frame and releases the window element for swivelling movement of the window element in the frame about an axis perpendicular to the direction of the sliding of the window element, wherein the track member is the bottom track member, wherein the structure includes suspension means between the window element and the top track member for accommodating the longitudinal sliding and swivelling movements of the window element, and wherein the suspension means comprises a pivot pin extending from the window element through a lengthwise slot in the top track member, and a roller carriage received in a space in the top track member above the slot, the pin being rotatably connected to the roller carriage and the carriage having pairs of rollers on opposite sides of the pin for engagement with laterally spaced flanges of the top track member defining the slot.

4,592,169

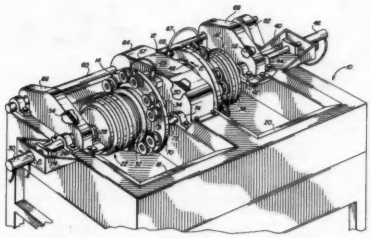
DISC GRINDER WITH FLOATING GRINDING WHEEL

Harold R. Klievoneit, Mesa, and Augustine G. Esposito, Phoenix, both of Ariz., assignors to St. Florian Company, Ltd., Phoenix, Ariz.

Continuation of Ser. No. 638,376, Aug. 7, 1984, abandoned. This application Feb. 5, 1985, Ser. No. 698,322

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—118 **17 Claims**



1. A machine tool for grinding and polishing a plurality of discs simultaneously, said machine tool comprising in combination:

(a) a first grinding wheel having an abrasive medium defining a plane for grinding one surface of the plurality of discs;

(b) a second grinding wheel having an abrasive medium defining a plane for grinding another surface of the plurality of discs;

(c) means for rotating said first and second grinding wheels about first and second axis of rotation, respectively;

(d) means for rotatably supporting each of a plurality of discs, for positioning each of the plurality of discs intermediate said first and second grinding wheels and for maintaining the plurality of discs simultaneously intermediate said first and second grinding wheels, said supporting and positioning means includes a plurality of freely rotatable pulley wheels for operative engagement with the perimeters of respective ones of the discs; and

(e) means for accommodating continuous self-alignment of said second grinding wheel to locate the plane of the abrasive medium attendant said second grinding wheel in parallel alignment with the plane of the abrasive medium attendant said first grinding wheel and to grind the surfaces of the discs parallel with one another.

4,592,170

ORBITAL ABRADING OR POLISHING TOOL

Alma A. Hutchins, Pasadena; Donald H. Hutchins, Sierra Madre, and Ronald Boord, Pasadena, all of Calif., assignors to Hutchins Manufacturing Company, Pasadena, Calif.

Filed Aug. 17, 1984, Ser. No. 641,778

Int. Cl.[4] B24B *23/00*

U.S. Cl. 51—170 MT **17 Claims**

1. A portable abrading or polishing tool comprising:

a body structure adapted to be held by a user to manipulate the tool;

a motor carried by said body structure;

a carrier driven rotatably about a first axis by said motor;

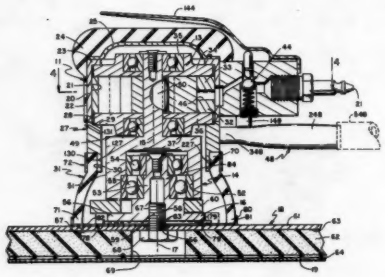
a part which is connected to said carrier for rotation relative thereto about a second axis offset from said first axis to drive said part orbitally as the carrier turns;

said part having a thread centered essentially about said second axis;

a head to be driven orbitally by said part and adapted to carry an element for abrading or polishing a workpiece;

a threaded fastener adapted to be connected detachably to said thread of said part and acting to attach said head to said part for orbital movement therewith;

a generally tubular member of flexible material for retaining said head against rotation while permitting orbital movement thereof and having a first end connected to said body structure; and

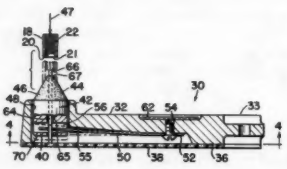


means carried by said flexible generally tubular member at a second end thereof and projecting inwardly essentially toward said second axis at a location to be confined axially between said head and said part and thereby attach said head to said flexible generally tubular member upon tightening of said fastener along said second axis relative to said part.

4,592,171
PAPER DRILL BIT SHARPENER

Richard D. Curley, 265 Prado Road, #1, San Luis Obisbo, Calif. 93401

Filed Aug. 28, 1985, Ser. No. 770,383
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—246 **22 Claims**



1. A tool for sharpening hollow paper drill bits including:

a base having:

a lower planar surface; and

a cavity which extends at a right angle to said lower planar surface;

a sharpener head having:

a conical sharpener portion for engagement with a bit to be sharpened; and

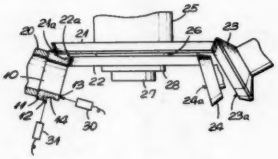
a support portion shaped to fit in said cavity and to move therealong; and

bias means between said sharpener head and said base to apply a sharpening force for application to the bit being sharpened from said base to said sharpener head.

4,592,172
METHOD OF MACHINING TAPERED ROLLER BEARING INNER RINGS

Tomoyoshi Egusa, Iwata, and Yutaka Yamauchi, Ogasa, both of Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00407, § 371 Date Aug. 9, 1982, § 102(e) Date Aug. 9, 1982, PCT Pub. No. WO83/01404, PCT Pub. Date Apr. 28, 1983
PCT Filed Dec. 24, 1981, Ser. No. 414,325
Claims priority, application Japan, Oct. 24, 1981, 56-170358
Int. Cl.[4] B24B *49/04*
U.S. Cl. 51—291 **4 Claims**



1. A method of machining tapered roller bearing inner rings comprising the steps of:

grinding a raceway groove of said inner ring;

measuring a raceway groove diameter at a fixed axial distance away from a cone back face of said inner ring;

converting any deviation of said raceway groove diameter from a target dimension into a deviation in the inner ring axial direction;

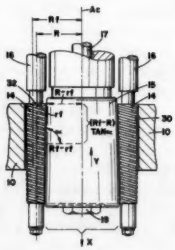
feeding back said converted value to an in-process control gauge for controlling subsequent grinding of a front face and cone back face rib surface of said inner ring; and

simultaneously grinding the front face and cone back face rib surface of the inner ring, respectively, by an end face grinding stone and a cone back face rib grinding stone which are connected together, the amount of stock removal by said grinding stones being determined by ceasing grinding in response to a stop signal supplied by said in-process control gauge when said target dimension is achieved.

4,592,173
HONE FOR GEROTOR STATORS, AND HONING METHOD

Hollis N. White, Jr., 243 Pyle Ln., Hopkinsville, Ky. 42240

Continuation-in-part of Ser. No. 320,465, Nov. 12, 1981, abandoned. This application Jun. 29, 1984, Ser. No. 626,446
Int. Cl.[4] B23F *19/05*
U.S. Cl. 51—330 **15 Claims**



1. Apparatus for honing a cylindrical bore or portion thereof, comprising in combination

a shaft, said shaft having an axis approximately coaxial with

said bore, said shaft having a sleeve-bearing portion thereof which is generally frustro-conical and coaxial with the axis of said shaft;

an abrasive sleeve, said abrasive sleeve having inner and outer generally frustro-conical surfaces, said outer surface of said abrasive sleeve being abrasive, being coaxial with said shaft, and having a radius at its larger end approximately equal to the radius of said bore, said inner surface surrounding the sleeve-bearing portion of said shaft and closely but slidingly fitting said sleeve-bearing portion, said abrasive sleeve being provided with a longitudinal slot therethrough and extending axially the length thereof, whereby radial expansion of said abrasive sleeve is permitted;

means to move said abrasive sleeve axially on said shaft at the said sleeve bearing portion thereof, whereby axial motion in the direction of increasing radius of said sleeve bearing portion causes said abrasive sleeve to be expanded radially;

means for rotating said shaft, together with said abrasive sleeve carried thereupon, about the axis of said shaft;

means for moving said shaft and abrasive sleeve through said bore in a direction substantially parallel to its axis so that said abrasive sleeve is caused to hone said bore;

a rotatable frustro-conical hone-supporting member having on its lateral aspect an outer frustro-conically curved face, and having an axis of rotation coincident with the geometric axis of said face, said face being shaped complementarily to said abrasive sleeve such that when said hone-supporting member and said abrasive sleeve are rotated, rolling contact is made between said face and said abrasive sleeve at a point outside said bore, said hone-supporting member thus supporting said abrasive sleeve and said shaft directly against movement radially toward said axis of rotation of said hone-supporting member, and thus urging said shaft and abrasive sleeve into said bore; and

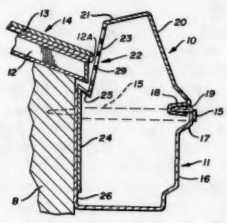
means for rotating hone-supporting member.

4,592,174

GUTTER PROTECTOR

John Hileman, 4227 Sheridan Rd., Youngstown, Ohio 44514

Filed Jan. 22, 1985, Ser. No. 693,462
Int. Cl.[4] E04D *13/00*
U.S. Cl. 52—12 **2 Claims**



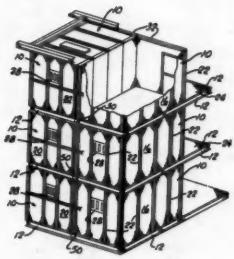
1. A gutter protector, for use on a gutter secured to a building having a roof portion with an eave, comprises a preformed elongated shape having an edge portion defining a channel, an angularly disposed front wall, an integral top and a back wall having a perforated upper portion and a lower portion, said angularly disposed front wall is of a height that is equal to said upper portion of said back wall, and wherein said upper portion of said back wall extends above the eave, means for securing said gutter protector in said gutter, a V-shaped angular extension between said upper and lower portions of said back wall.

4,592,175

MODULAR HABITATION STRUCTURE

William J. Werner, Butler, Pa., assignor to Werner Metal Industries, Inc., Ford City, Pa.

Filed May 30, 1984, Ser. No. 615,123
Int. Cl.[4] E04H *3/00*
U.S. Cl. 52—79.9 **7 Claims**



1. A modular habitation structure for use in a multi-story building having more than two such structures stacked one on top of another, each of said structures comrpising:

rigid floor framing having a plurality of securely interconnected support members defining a desired room outline;

upright rigid sheet wall members fixed at their respective lower ends to said support members and rigidly fixed at their respective height dimensions to each other to define side enclosures of a room;

a rigid ceiling member rigidly fixed to upper portions of each of said wall members;

said wall members and said ceiling member having a plurality of abutting panels rigidly secured to each other, said panels having end sections defining generally C cross-section shapes with said panels being secured to each other at the end sections whereby integral structural reinforcing members are defined by adjacent, abutting end sections;

connections means for rigidly connecting said ceiling member to said floor framing of another completely constructed said room stacked on top of a lower said room;

securing means for rigidly securing a completely constructed said room to an adjacent said room;

holding means for securing walkways, elevator shafts, and other building components to said floor frames; and

said wall members, said floor framing, said connection means, said securing means, said holding means, and said ceiling member having vertical and lateral strength properties and being constructed and arranged and interconnected with each other such that all said members, floor framing, connecting means, securing means and holding means have a unitary integrated construction with a vertical load bearing capacity of a predetermined value more than that of the weight of two or more completely constructed said rooms and a lateral force bearing capacity above a predetermined value;

said wall members being further constructed and arranged with respect to said floor framing and said ceiling member such that said wall members will mate with wall members of adjacent completed said rooms; and

said ceiling member being further constructed and arranged with respect to said wall members such that said ceiling member will mate with the underside of a said floor frame of a complete said room stacked on top of said ceiling member.

4,592,176

ROOF EDGING SYSTEM

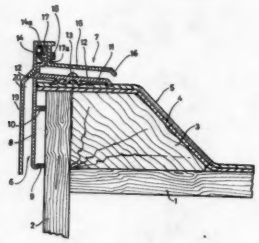
Frederik C. van Herpen, RR Burgh-Haamstede, Netherlands, assignor to Alprokon Promotie en Ontwikkeling B.V., Netherlands

Filed Jul. 23, 1984, Ser. No. 633,333

Claims priority, application Netherlands, Jul. 26, 1983, 8302645

Int. Cl.[4] E04D *13/15*

U.S. Cl. 52—96 5 Claims



1. Roof edging section system comprising a first section provided with a web portion to be fastened parallel to the vertical roof edge and a first rib extending transversely thereto, in which the first rib rests upon the roof covering layer and the section supports a second, easily dismountable and staggered second section, which has a cover strip laying above the first rib.

4,592,177

COLUMN-MOUNTED APPLIANCES

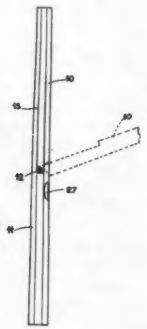
John W. Pratt, Church Broughton, England, assignor to Abacus Municipal Limited, Nottinghamshire, England

Filed Jan. 17, 1984, Ser. No. 571,668

Claims priority, application United Kingdom, Jan. 28, 1983, 8302389

Int. Cl.[4] E04H *12/34*

U.S. Cl. 52—116 24 Claims



1. A column-mounted appliance comprising a column composed of a lower column part and an upper column part, a generally horizontal pivot by means of which said upper column part is connected to said lower column part for pivotal lowering and raising movement relative thereto, an applicance mounted on said upper column part, means permitting said upper column part to be moved relative to said lower column part through a limited vertical displacement between a lock position and a release position, a mechanical interlock operative to prevent said upper column part from being pivotally lowered about said generally horizontal pivot unless said upper column part is first moved through said limited vertical displacement into said release position, and a releasable locking device operable to hold said upper column part in said release position during pivotal lowering and raising of said upper column part, said locking device being composed of normally vertically disposed closed ended configurated slot means provided in one of said upper and lower column parts and a shaft rotatably mounted on the other of said upper and lower column parts, the configurated slot means including a relatively narrow portion and a first relatively wide portion, said shaft being received in the configurated slot means and being moved from one of said relatively narrow and wide portions to the other as said upper column part is moved between said lock and release positions, said shaft having an external surface which is non-circular in cross-section and being rotatable relative to said other of said column parts between a first rotational position wherein said shaft can enter said relatively narrow portion of the configurated slot means and a second rotational position wherein said shaft cannot enter said relatively narrow portion.

4,592,178

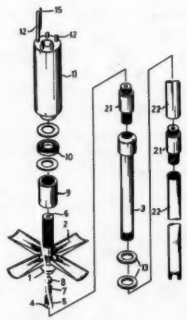
GROUND ANCHOR

Hsi H. Lu, 2-6, Alley 17, Lane 76, Ho-Ping East Rd., Sec. 2, Taipei, Taiwan

Filed Apr. 9, 1985, Ser. No. 721,369

Int. Cl.[4] E02D *5/44*

U.S. Cl. 52—155 4 Claims



1. A ground anchor means for anchoring an aboveground structure, comprising a front section with an anchor at its front end, and a plurality of like connecting units connected in series behind said front section, said front section and said connecting units being centrally hollow to define a channel from the rear end of the rearmost connecting unit to the front end of said front section, said front section comprising drilling means at its tip end, and a plurality of arms, one end of each said arm is pivoted to a definite spot of said front section so as to be able to swing with a range of no more than 90 degrees between a first position where each said arm lies substantially parallel to the axial direction of said front section with its free end pointing to the rear end of the rearmost connecting unit, and a second position where each said arm extends outwardly and radially and intersect with the central axis of said front section at an angle no more than 90 degrees, characterized in that said front section comprises elements arranged in series including a first element, of which the front end defines a drill bit and has an outlet for said channel, a second element to which said arms are pivotally mounted, the front end of said second element being engageable with the rear end of said first element, a third element, in form of a double-thread nut, with its both ends internally threaded and its front end being engageable with the rear end of said second element, a fourth element with its front end engageable with the rear end of said third element and its

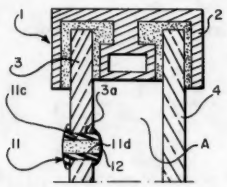
rear end having an enlarged outer diameter, a fifth element in form of a socket encircling the majority of the length of the fourth element, said fifth element being provided with a plurality of rods extending axially and rearwardly to the rear end of the rearmost connecting unit.

4,592,179

INSULATED WALL PANELS

Jacques Boutarin, 4 rue de Sarda, 26200 Montelimar, France

Filed May 23, 1983, Ser. No. 497,242
Int. Cl.[4] E06B *7/12*
U.S. Cl. 52—172 **10 Claims**



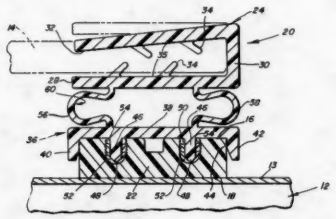
1. Method for manufacturing and mounting multiwall insulating panels that form an internal space, the multiwall insulating panels are more particularly used for glazing of buildings, comprising cutting a portion of at least one plate of the panel on an external side, securing a permeable capsule (11) in the cut out portion, said capsule having unidirectional means for evacuating with unidirectional effect vapors, in excess, under tension within the internal space (A) between the panels; and mounting the multiwall panel in situ so that the capsule will evacuate with unidirectional effect excess vapors in the internal space.

4,592,180

MAGNET SUPPORT AND RETAINER FOR INTERIOR STORM WINDOWS

John T. Gerritsen, Wauconda III., assignor to Jarrow Products, Inc., Chicago, Ill.

Filed Mar. 19, 1984, Ser. No. 591,037
Int. Cl.[4] E06B *3/28*
U.S. Cl. 52—203 **12 Claims**



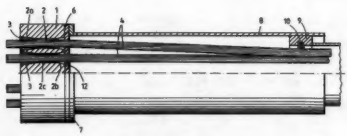
11. A combined support and retainer for a magnet body and a generally rigid sheet material comprising first and second rigid support portions, and unitary connecting portions therebetween, said first portion including a side opening slot for securely accommodating edgewise a rigid sheet material, said second portion having outwardly opening cavity defining means for retaining a magnet body, a magnet body having inner and outer generally parallel faces, said second portion further having longitudinally extending depending tongue means, and longitudinal groove means formed in the inner face of said magnet body capable of receiving said tongue means therein when said magnet body is received with said cavity, the cavity being of size and configuration for retaining said magnet body force-fitted therein, said tongue means including outwardly extending barb means having tips of lesser durometer whereby to permit limited resilience between the magnet body and the retainer to afford compensation for variations in the surfaces to which the magnet body is adhered whereby to preserve the engagement of the magnet thereto.

4,592,181

ANCHORING OF FREELY OSCILLATING TENSION ELEMENTS OF STEEL OF A DYNAMICALLY STRESSED STRUCTURAL COMPONENT

Peter Matt, Ittigen, Switzerland, assignor to Losinger AG, Bern, Switzerland

PCT No. PCT/CH84/00128, § 371 Date Apr. 15, 1985, § 102(e) Date Apr. 15, 1985, PCT Pub. No. WO85/01080, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 15, 1984, Ser. No. 726,899
Claims priority, application Switzerland, Aug. 22, 1983, 4567/83
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 L **8 Claims**



1. Anchoring of freely oscillating tension elements (4) of steel of a dynamically stressed structural component, which tension element (4) are deflected twice in the anchoring region, having an anchor body (1) with bores (2) running parallel to one another, through which the tension elements (4) are led and are anchored by means of wedge clamps (3) at their ends in spaces (2*a*) of the bores (2) opening conically outwards, supporting means against which the tension elements (4) rest being provided for in the deflection region of the anchor body (1) for the purpose of taking-up of deflecting forces, and having a spreader ring (9) for bunching the tension elements (4) exiting from the anchor-body bores (2) and running through the spreader ring (9), characterized in that the diameter (D) of each bore (2) in the section (2*c*) from the space (2*a*) opening conically outwards up to approximately the exit end (2*b*) is constant and larger than that (d) of the tension element (4), that the supporting means are provided for as oscillatable supporting means (5, 13, 14, 6) only in the region of the exit ends (2*b*), and that the spreader ring (8) exhibits on its surface facing the tension elements (4) an insert (10), resting against the tension elements (4), which is made of a softer material than that of the spreader ring (9) or of the tension elements (4).

4,592,182

CORNERING SYSTEM FOR BUILDINGS

Theodore P. Felser, Winter, Wis., assignor to Felser Forest Products, Inc., Winter, Wis.

Continuation of Ser. No. 243,363, Mar. 13, 1981. This application May 3, 1984, Ser. No. 606,544
Int. Cl.[4] E04B *1/10*
U.S. Cl. 52—233 **2 Claims**

1. An improved cornering system for log buildings comprising:

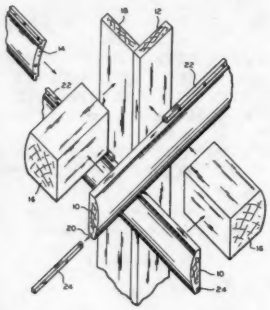
conventionally assembled corner studs;

an extended siding portion affixed to said corner studs and extending beyond the corner, having a rounded outer surface;

a shortened siding portion affixed to said corner studs in the same layer of siding as said extended portion but on the intersecting wall, said shortened portion having a rounded outer surface and being cut off short of the corner in a

concave shape so as to leave a gap between itself and said extended portion;

a log block having a rounded outer surface inserted into the gap between said shortened portion and said extended



portion such that its rounded outer surface fits into the concave cut formed in said shortened portion; and

said log block further being secured to said corner studs and said extended portion such that a projection similar in appearance to a log end protrudes beyond the corner.

4,592,183

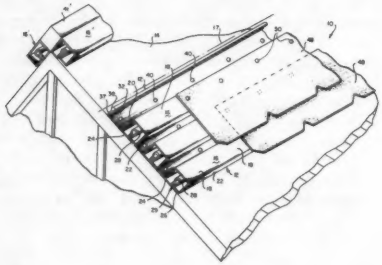
MODULAR ROOFING SYSTEM

Jacques L. See, Malibu, Calif., assignor to Honeycomb Panels Patent Association, Inc., Malibu, Calif., a part interest

Filed Nov. 17, 1983, Ser. No. 552,801

Int. Cl.[4] E04D *1/34, 1/26*

U.S. Cl. 52—309.4 **22 Claims**



1. A modular roofing system for overlying a base structure comprising:

a plurality of elongated modules having identical cross-sections, each module including a principal body member defining a planar upper surface for the module and a recessed guideway therein accessible from the underside thereof, the module also including a planar web member extending from the principal body member and defining a bottom surface for the module, and a locking member engaged to the free edge of the web member and spaced apart from the body member, the locking member being configured to mate within the recessed guideway within the adjacent module, the modules being disposed in successive tiers with the locking members of one tier mating within the recessed guideways of an adjacent tier; and

a plurality of overlying covering members affixed to the planar upper surface of the principal body members.

4,592,184

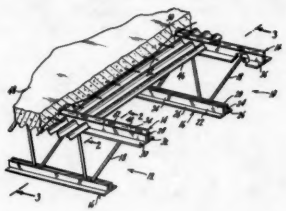
COMPOSITE FLOOR SYSTEM

Joel I. Person, 19 Rosalie Pl., Commack, N.Y. 11725, and Atle Gjelsvik, Tappan, N.Y., assignors to Joel I. Person, Commack, N.Y.

Filed Jul. 16, 1984, Ser. No. 630,965

Int. Cl.[4] E04B *1/16, 5/19*

U.S. Cl. 52—334 **2 Claims**



1. A joist particularly for use in a composite concrete floor system, comprising a top chord, a bottom chord and a web including tension and compression members in the space between the top and bottom chords and secured to said top and bottom chords, said top chord including a pair of metal bars each having an angle shape in cross section and each having a vertical leg and a horizontal leg, the vertical leg of the first bar being higher than the vertical leg of the second bar and having protrusions formed therein and the top of the web being secured to the lower surface of the top chord.

4,592,185

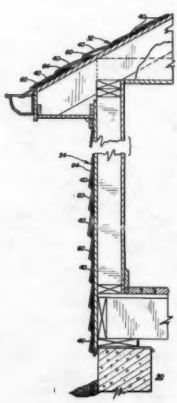
BUILDING PANEL

Steven K. Lynch, Elgin; Erland D. Narhi, Streamwood, and Frank J. Walter, Aurora, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Jul. 2, 1984, Ser. No. 627,192

Int. Cl.[4] E04D *1/00*

U.S. Cl. 52—543 **20 Claims**



1. A building panel for ecterior and interior wall and roof surfaces, comprising:

an outer shell formed entirely of relatively thin, molded hardboard material, having upper and lower edges and opposite ends, and a molded, outwardly convex outer face adapted for exposure to weather and a molded back sur-

face contoured to generally follow the contour of the surface of said outer face;

said shell having cross-sectional profile extending transversely between said upper and lower edges of said panel comprising a sloped lower edge portion extending outwardly of said lower edge and sloped upwardly toward said upper edge from a back plane of said panel defined to extend directly between said upper and lower edges, said sloped lower edge portion joining an intermediate facia portion spaced apart outwardly of said back plane, a plurality of spaced apart fastener receiving depressions aligned in a row extending between said opposite ends of said panel adjacent an upper edge of said intermediate facia portion, said depressions having a base spaced inwardly thereof with a back face of said depression bases on said back plane, and an upper edge portion above and adjacent said row of fastener receiving depression and terminating along said upper edge of said panel,

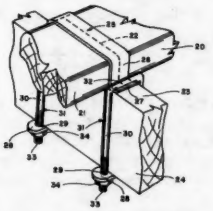
said shell having a depth dimension between said outer face on said intermediate facia portion and said back plane that is substantially greater than the nominal thickness of said shell as measured directly between said outer face and said back at any point thereon.

4,592,186

HEAVY DUTY ANCHOR FOR DECK BOARDS AND THE LIKE

Paul A. Braginetz, Staunton, Va., assignor to B. P. Fishburne, Jr., Washington, D.C. and Marlin G. Wilson, Staunton, Va.

Filed Jul. 30, 1985, Ser. No. 760,468
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—699 **11 Claims**



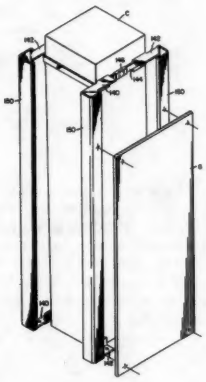
1. A deck board anchor for deck boards having substantially abutting end portions resting on a truss beneath the deck boards comprising a deck board hold-down means adapted to positively engage the top faces of deck board end portions, a resistance means adapted to positively engage a truss supporting deck boards, a threaded adjustable connector means between said hold-down means and said resistance means and being operable to cause the hold-down means and resistance means to simultaneously exert forces on the deck boards and truss supporting deck boards to draw such elements together in anchored relationship, said deck board hold-down means comprising a strap means adapted to span deck board end portions transversely and having descending elements at the opposite ends thereof, said threaded adjustable connector means being positively engaged with said descending elements, said descending elements comprising spaced descending arms adapted to straddle a truss supporting deck boards, and said threaded adjustable connector means including spaced pairs of connector elements positively engaged with said arms.

4,592,187

METHOD AND APPARATUS FOR ATTACHING FURRING TO COLUMNS

Robert C. Crites, P.O. Box 513, Euless, Tex. 76039, and Wilbur R. Youngs, Allen, Tex., assignors to Robert C. Crites, Euless, Tex.

Division of Ser. No. 370,175, Apr. 20, 1982, Pat. No. 4,484,427.
This application Aug. 31, 1984, Ser. No. 646,055
Int. Cl.[4] E04C *3/30*; E04B *1/94*
U.S. Cl. 52—741 **8 Claims**



1. A method of attaching furring adjacent a structure comprising:

attaching a corner clip adjacent the structure, the clip comprising one leg for attachment adjacent the structure and a second leg extending from the first leg with a portion thereof extending substantially longitudinal of said structure;

positioning the first end of a corner angle over the second leg of the corner clip to fix the first end of the angle relative to the structure;

positioning the second clip adjacent the structure remote from the first clip;

engaging the end of the corner angle opposite the first end around the second corner clip;

plumbing the corner angle by moving the second clip and angle until said angle is plumb;

fixing the second clip to maintain the corner angle plumb; and

attaching a furring to the corner angle.

4,592,188

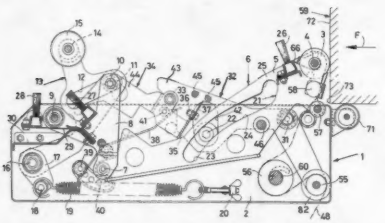
AUTOMATIC TAPING UNIT WITH IMPROVED SYSTEM OF WITHDRAWAL OF THE TAPE APPLYING ROLLERS FOR CARTON SEALING MACHINES

Augusto Marchetti, Piazza Sicilia, 7-20146 Milano, Italy

Filed Oct. 16, 1985, Ser. No. 788,223
Claims priority, application Italy, Oct. 17, 1984, 23192 A/84
Int. Cl.[4] B65B *51/06*; B65C *1/04*
U.S. Cl. 53—137 **10 Claims**

1. Automatic taping unit for carton sealing machines, comprising a casing adapted to be fixed to a sealing machine along the carton advancement path, an inlet applying roller and an outlet applying roller elastically urged to project from said casing to be engaged and forced to return into said casing by the front of an advancing carton, an adhesive tape supply arranged to put, at rest, a free end of the tape in contact with said inlet roller in order to be engaged and adhesively drawn forward by the carton front and further realized in such a way as to allow subsequently said tape to follow the drawing of said free end and to slide on said inlet roller to extend adhesively

along the adjacent horizontal wall of the carton, and a cutting blade arranged between said inlet and outlet rollers and provided with actuating means capable of causing it to return into the outline of said casing before being reached by the carton front and to project from said outline for cutting the tape between said inlet and outlet rollers after having been overcome by the rear wall of the carton and before said horizontal



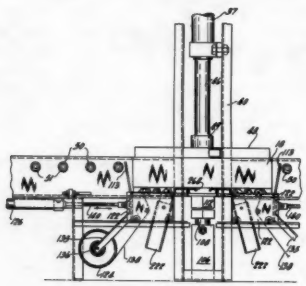
wall of the carton abandons said outlet roller, characterized in that said inlet applying roller is supported by a pair of movable support arms with the withdrawal movement guided by shaped windows engaged with a fixed pivot, said windows having a lower end portion very inclined with respect to a horizontal plane, an extended intermediate portion less inclined with respect to a horizontal plane and an almost vertical upper end portion.

4,592,189

APPARATUS FOR CLOSING AND SEALING TELESCOPING BOXES

Phillip J. Martini, 1615 Crestview Dr., Oshkosh, Wis. 54901

Filed Oct. 28, 1983, Ser. No. 546,658
Int. Cl.[4] B65B *61/00*
U.S. Cl. 53—137 **20 Claims**



1. An apparatus for closing and sealing a box wherein it is desired to apply a plurality of L-shaped pieces of tape to a plurality of locations on the bottom and side of said box, said apparatus comprising:

a support plate means for said box and means for vertically moving said support plate between a first position and a second lower position, wherein said means for vertically moving said support plate means comprises a cylinder means having a piston rod means extending therefrom, said piston rod means being coupled to said support plate means,

pressure plate means arranged above said support plate means and means for vertically moving said pressure plate means between a first raised position and a second lowered position;

a tape applying means for simultaneously applying said L-shaped pieces of tape to said box when said support plate means is in its second position, wherein said tape applying means comprises tape supply means and a tape head for each piece of tape to be applied and means for simultaneously moving said heads in a horizontal direction from a first position wherein said heads are adjacent to but spaced laterally from said support plate means when said support plate means is in its second position to a second position wherein said tape heads are located beneath said support plate means wherein said tape heads are each adapted to place a piece of tape on the bottom of a box supported on said support plate means when said support plate means and said tape heads are in their respective second positions and to press each piece of tape toward and around the edge of said box and up onto the side thereof as said tape head is moved from its second to its first position.

20. A tape head for applying an elongate piece of tape to an article having a first planar surface and a second planar surface perpendicular thereto and forming an edge therewith wherein it is desired to apply an L-shaped piece of tape onto both planar surfaces and around the edge of said article, said tape head comprising:

a housing having an open top,

a first roller means extending from said housing and through said top, said first roller means being spring loaded whereby downward pressure of the article to be taped on said roller forces said roller means toward the interior of said housing against spring forces;

knife means extending from said housing and through the top thereof and adjacent to said first roller means, said knife means being spring loaded whereby said downward pressure on said knife means forces said knife means toward the interior of said housing against spring forces; and

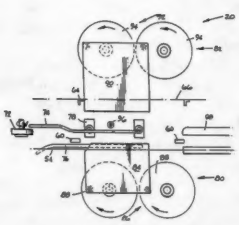
follow roller means extending from said housing and through the top thereof and adjacent to said knife means, said follow roller means being spring loaded whereby said downward pressure on said follow roller means forces said follow roller means toward the interior of said housing means and wherein said follow means normally extends from the top of said housing by a distance which is greater than that of said first roller means or said knife means.

4,592,190

SLEEVE CARTON END PANEL AND FLAP FOLDING AND SEALING ASSEMBLY

Earle C. Sherman, and James B. P. Green, Jr., both of West Monroe, La., assignors to Johns-Manville Corporation, Denver, Colo. and Southern Tool Company, Inc., West Monroe, La.

Division of Ser. No. 501,953, Jun. 7, 1983, Pat. No. 4,519,181.
This application Mar. 11, 1985, Ser. No. 710,450
Int. Cl.[4] B65B *57/02*
U.S. Cl. 53—491 **4 Claims**



1. In a packaging machine a method of folding closure flaps in sequential fashion in a continuously moving line of open ended cartons advancing in a predetermined direction without

physically adjusting the normal position or function of machine piece parts comprising the steps of

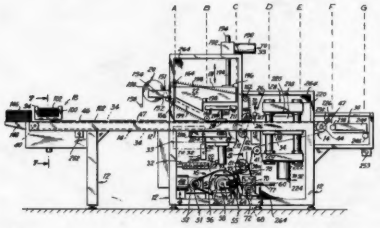
folding the flaps by continuously cycling movable closure elements in a vertical plane, said elements being movable in said plane to develop a vertical stroke component defining an open flap position and a closed flap position, and controlling the stroke of the closure elements relative to the moving line of cartons so that when the advance of the cartons is stopped the flap folding cycle stops with the closure elements in the closed flap position.

4,592,191

AUTOMATIC SKIN PACKAGING APPARATUS

George Simington, Piscataway, N.J., assignor to Simanex Inc., Piscataway, N.J.

Filed Nov. 17, 1982, Ser. No. 442,285
Int. Cl.⁴ B65B *11/52*
U.S. Cl. 53—509 **17 Claims**



1. Apparatus for the automatic thermoplastic film packaging of articles on substrates comprising, conveyor means for advancing article-bearing substrates through said apparatus, drive motor means for driving said conveyor means, connecting means operatively connecting said drive motor means to said conveyor means for intermittently advancing said conveyor means in response to the operation of said drive motor means, said drive motor means being rotatable in one direction only, said connecting means comprising overrunning clutch means operatively connected to said conveyor means, and means operatively connected to said drive motor means and said overrunning clutch means and operable in response to the rotation of said drive motor means to rotate said overrunning clutch means in two directions, said overrunning clutch means being operable in turn to advance said conveyor means in response to rotation of said overrunning clutch means in one direction, only.

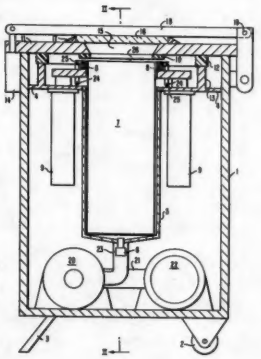
4,592,192

APPARATUS FOR THE PACKAGING OF CONTAMINATED WASTE MATERIALS

Manfred Jacob, and Fritz Tews, both of Linkenheim-Hochstetten, Fed. Rep. of Germany, assignors to Gesellschaft fuer Nukleartechnik mbH, Linkenheim, Fed. Rep. of Germany

Filed Jul. 15, 1983, Ser. No. 514,270
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231221
Int. Cl.⁴ B65B *31/02*
U.S. Cl. 53—512 **10 Claims**

1. Apparatus for packaging contaminated or poisonous waste materials, said apparatus comprising a container having bottom and side walls, a top plate extending across said container at its top end, a cylinder sealingly mounted on said top plate and extending downwardly into said container, said cylinder being closed at its bottom and adapted to receive a plastic bag with an outwardly projecting top rim, a cover pivotally supported on said container so as to seal said container when said cover is closed, said cover being spaced from said top plate and having an opening in alignment with said cylinder, a lid pivotally disposed on top of said cover so as to seal said cover opening when in its closed position, a vacuum pump disposed in said container and having an inlet and an outlet, a suction duct connected between said inlet and a suction space between said top and cover plates so as to permit removal of air from said suction space, an absolute filter also disposed in said container, said pump having its outlet in communication with said absolute filter so as to supply its discharge air to said filter, said top plate having a trough formed therein for the reception of cover foil, means for moving said cover foil within the suction space over the opening of said plastic bag, a heating ring axially movably disposed at the top of said cylinder, said cover plate having an abutment surface area disposed opposite said heating ring, means for axially moving said heating ring toward said cover against said abutment surface with the rim of a plastic bag disposed in said



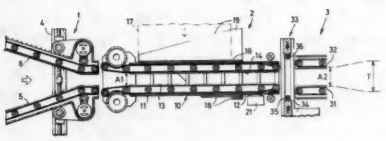
cylinder and said cover foil engaged therebetween, and electric control means for operating said vacuum pump upon opening of said lid to remove air from said suction space thereby preventing the escape of poisonous material from said container when said lid is opened and for the control of the vacuum pump and energization of said heating ring during heat welding operation of said cover foil onto said plastic bag when said lid is closed, said vaccum pump being adapted to evacuate said suction space and, together therewith, said cylinder so as to perform said heat welding operation of said cover foil onto said plastic bag under vacuum whereby, upon subsequent admission of ambient air to said suction space and said cylinder, said sealed plastic bag with the waste material contained therein is compressed and maintained compressed by the ambient air.

4,592,193

APPARATUS FOR PACKAGING RESILIENTLY COMPRESSIBLE ARTICLES

Olov E. Gustavsson, Svartbrödragatan 9F, Kungälv, Sweden (S-442 00)

Filed Aug. 16, 1983, Ser. No. 523,756
Claims priority, application Sweden, Aug. 26, 1982, 8204896
Int. Cl.⁴ B65B *63/02*
U.S. Cl. 53—530 **4 Claims**



1. An apparatus for packaging discrete and resiliently com-

pressible articles of substantially uniform and generally rectagular shape in a compressed state, said apparatus comprising in combination;

(a) article compressing conveyor means having an inlet end and an outlet end for advancing in mutually spaced succession the discrete articles between said inlet and outlet ends while materially reducing the dimension of each article in a direction perpendicular to the direction of advance thereof;

(b) an elongate, rigid nozzle structure having an inlet end and an outlet end and surrounding an open-ended, straight passageway of generally rectangular cross section for the compressed articles emanating from the outlet end of said article compressing conveyor means, said nozzle structure being supported only near its inlet end in a manner to present a freely extending outlet end portion of substantial length having an outer cross-sectional contour which is of substantially uniform size and shape throughout said free length;

(c) a pair of cooperating and synchronously driven endless belt conveyors extending longitudinally through said nozzle structure and close to opposite walls of said passageway therein up to the outlet end of said nozzle structure, those portions of said two belt conveyors extending through said free outlet end portion of said nozzle structure being located entirely inside the latter, said two belt conveyors being operative to advance the compressed articles emanating from said article compressing conveyor means through said nozzle structure while maintaining their reduced sizes;

(d) tube forming means for forming outside and around said free outlet end portion of said nozzle structure and from a continuously supplied web of flexible, heat-sealable wrapping material a continuous, longitudinally sealed tube adapted to receive therein at spaced intervals the compressed articles discharged through the outlet end of said nozzle structure, said tube forming means comprising a web-folding plow device embracing said free outlet end portion of the nozzle structure in closely spaced relationship thereto for causing the wrapping web to successively surround said outlet end portion and the longitudinal margins of the web to meet in overlapping relationship, and heat-sealing means for successively sealing together the overlapping longitudinal margins of the web while the same is still surrounding said outlet end portion of the nozzle structure;

(e) a double-belt discharge conveyor having an inlet end facing the outlet end of said nozzle structure in spaced relationship thereto and being operative to receive and further advance the tube coming from the outside of said nozzle structure as well as the compressed articles coming from the inside thereof and being surrounded by said tube, said discharge conveyor being adapted to maintain over a considerable length of path a sufficient compression of said articles to prevent them from completely filling up the interior cross section of said tube and from thus exerting expansion forces thereon; and

(f) means located in the vicinity of the outlet end of said nozzle structure for selectively feeding forward over said nozzle outlet end the tube formed around said outlet end portion of the nozzle structure, said tube feeding means comprising two transversely extending feed rollers rotatably mounted inside said nozzle structure close to opposite walls of said passageway therein and being driven by the respective ones of said two endless belt conveyors in said passageway, said feed rollers being exposed to the outside of said nozzle structure through corresponding slots in said walls; two idling pressure rollers, one for each of said feed rollers and coextensive therewith, rotatably and movably mounted outside said nozzle structure in a manner to let the tube formed around said outlet end portion of the nozzle structure pass freely between the latter and said pressure rollers; and means for selectively moving both of said pressure rollers towards the respective ones of said feed rollers in order to make the tube engage the latter for thus effecting feeding of the tube.

4,592,194

PROCESSING APPARATUS FOR STALK-SHAPED AGRICULTURAL PRODUCTS

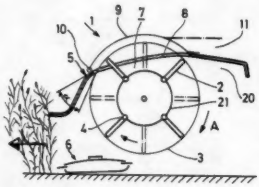
Jean-Pierre Amstutz, Birr, Switzerland, assignor to Bucher-Guyer AG, Niederweningen, Switzerland

Filed Jul. 12, 1984, Ser. No. 630,083

Claims priority, application Switzerland, Aug. 15, 1983, 4433/83

Int. Cl.[4] A01D *43/00*

U.S. Cl. 56—16.4 **18 Claims**



1. A processing apparatus for agricultural stalk-shaped products, the products being adapted to be formed into a stream of products following cutting thereof from the ground,

comprising in combination

rotatably driven conveyor means including a plurality of approximately radially outwardly extending conveyor tools separated from one another by gaps, and operatively defining a trajectory,

a guide wall having a plurality of elongate openings, cooperating with said conveyor means for guiding the products, and forming with said conveyor means a guidance channel extending transversely to said stream of products,

said guide wall intersecting said trajectory near the front end and near the rear end of said guidance channel, so that said conveyor tools project at least partially outwardly through corresponding openings in said guide wall.

4,592,195

DEVICE FOR MAKING CABLED YARNS OF IMPROVED REGULARITY

Simon Charbonnier, 97 rue Pasteur, Caluire, 69300, France

Filed Jun. 4, 1985, Ser. No. 741,087

Claims priority, application France, Jun. 5, 1984, 84 08975

Int. Cl.[4] D02G *3/28, 3/00, 3/48;* D01H *7/00*

U.S. Cl. 57—58.36 **2 Claims**

1. A device for directly making a high-resistance cabled yarn having improved regularity, comprising:

A. yarn twisting means, comprising:

(a) a first progressive braking device having multiple successive elements operative to receive a first yarn having multiple component strands and to distribute tension regularly therebetween and render the strands substantially parallel;

(b) false twist spindle means including a rotating spindle having a radial channel for receiving the first yarn, said spindle means supporting the supply bobbin of a second yarn;

(c) a second braking device on the spindle means and operative to receive the second yarn and apply thereto a regular braking force;

(d) a first pulley system disposed axially of the spindle means and mounted to rotate thereabout, the first system including two pulleys coupled for rotation together and said pulleys receiving the respective yarns wound therearound and driving the coupled pulleys whereby to impart to the two yarns identical rates of advance,

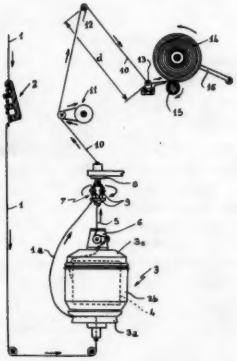
and the system rotating to twist the first and second yarns together to form a composite yarn;

(e) a second system of pulleys disposed to receive and wind the composite yarn therearound to stop progression of the twist along the passing yarn; and

B. yarn winding means, comprising:

(a) a constant linear speed winding device and receiving bobbin; and

(b) a yarn distributor means located adjacent to the winding device and receiving bobbin and reciprocating with a transverse stroke across the receiving bobbin, said



yarn twisting means delivering the composite yarn in a transverse plane passing through the center of the stroke of the distributor means, and the composite yarn distributor means being spaced by a large distance d from the yarn twisting means whereby to minimize variations in the distance d as the distributor means progresses on either side of the center of the stroke so that tensions in the composite yarn are distributed very regularly between its various strands to provide a composite tensile strength substantially equal to the combined tensile strengths of the strands.

4,592,196

CAP OR BELL SPINNING MACHINE

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jan. 4, 1985, Ser. No. 688,933

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400327

Int. Cl.[4] D01H *7/66*

U.S. Cl. 57—74 **18 Claims**

1. A cap spinning machine, comprising:

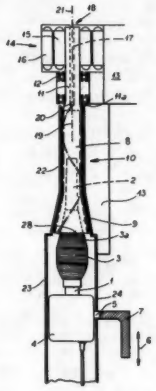
a rotating spindle defining an axis;

a spool sleeve connected to said spindle along a portion thereof and being provided to carry a thread winding forming a spool;

a cap extending over said spool and said sleeve and being rotatable about an axis of rotation;

means for rotatably supporting said cap;

guiding means arranged in the axis of rotation of said cap for leading the thread in helical manner around the outer surface of said cap, said cap being brought into the rotational motion by said spindle by means of the thread so that the rotational speed of said cap is entrained in rotation by the thread; and



means for axially displacing said cap and said spool relatively to build said spool on said sleeve.

4,592,197

RING-SPINNING OR RING-TWISTING MACHINE WITH RESTART CONTROL

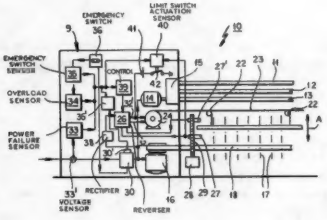
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Oct. 4, 1984, Ser. No. 657,781

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336040

Int. Cl.[4] D01H *13/14, 1/20;* **B65H** *54/28*

U.S. Cl. 57—277 **10 Claims**



1. A machine for producing a yarn bobbin comprising:

at least one ring rail which moves up and down,

a plurality of spindles,

a ring rail drive to drive said spindles,

a control means for said ring rail drive, which, in case of unforeseen machine stoppage, causes said ring rail drive, when said ring rail drive would otherwise drive said ring rail in the upward direction on restart because said ring rail had been moving upward at the instant of shut-off, to reverse so that said ring rail motion direction is downward no later than the time of said restart of said spindles, so that said ring rail runs in said downward direction after said unforeseen machine stoppage at the beginning of said restart.

10. A method of

operating a spindle bank having a ring rail and winding yarn on respective bobbins on respective spindles of said spindle bank, comprising the steps of:

(a) detecting at least one indication of unforeseen stoppage of the spindle bank including:
(i) failure of electrical current supply to a drive motor for said bank,
(ii) mechanical overload, and
(iii) emergency switch operation;
(b) automatically determining the position of said ring rail upon the development of said at least one indication;
(c) at the latest upon restarting of said spindle bank switching over automatically the direction of operation of a drive for said ring rail if the position of said ring rail is such that it would tend to rise upon startup, thereby ensuring that said ring rail will move downwardly on startup; and
(d) restarting said spindle bank.

4,592,198

SUCTION CONTROL ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

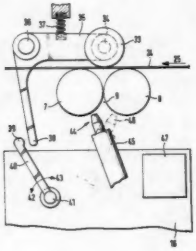
Fritz Stahlecker, Josef-Neidhart Strasse 18, 7347 Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,101

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434873

Int. Cl.[4] D01H *7/882, 7/885, 11/00*

U.S. Cl. 57—401 **17 Claims**



1. An open-end friction spinning machine having at least one spinning unit including drivable friction surface means defining a yarn formation zone, suction air stream means adjacent the yarn formation zone for creating a suction effect in the yarn formation zone, said suction effect and said friction surface effect being capable of creating an overall friction effect in said yarn formation zone, comprising:

surface friction effect examining means for determining said surface friction effect of said friction surface means, said surface friction effect examining means being capable of determining said surface friction effect without altering said friction surface means.

4,592,199

GAS TURBINE ENGINE WITH PULVERIZED COAL FIRING

Jakob Huber, Les Aveneyres 8, CH-1806 St-Legier, Switzerland

Filed May 22, 1984, Ser. No. 613,023

Claims priority, application Switzerland, Jun. 6, 1983, 3082/83

Int. Cl.[4] F02C *3/26*

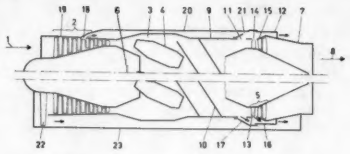
U.S. Cl. 60—226.1 **6 Claims**

1. A gas turbine engine operable with a fuel of pulverized coal, comprising:

an air compressor:

a combustion chamber downstream of said air compressor, said combustion chamber including coal-fired burners at a skewed angle with respect to a longitudinal axis of said gas turbine engine and a casing having radially disposed openings in a portion of said combustion chamber casing downstream of said burners;

a turbine downstream of said combustion chamber;



means for extracting compressed air from an intermediate stage of the compressor; and

a duct communicated with said extracting means and said radially disposed openings.

4,592,200

TURBO-JET ENGINE AFTERBURNER SYSTEM

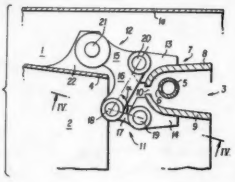
René A. Benoist, Le Mee sur Seine; Michel R. Clauzel, Varennes-Jarcy, and Roger A. J. Vandenbroucke, Antony, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation - S.N.E.C.M.A., Paris, France

Filed Sep. 5, 1984, Ser. No. 647,398

Claims priority, application France, Sep. 7, 1983, 83 14249

Int. Cl.[4] F02K *3/10;* **F02C** *1/00*

U.S. Cl. 60—261 **5 Claims**



1. An annular burner for an afterburner in a bypass turbofan engine with two separated flows, having a separation wall between said two flows, comprising:

an annular flame stabilizer having a cross-section approximating a V, said V cross-section being formed by two separate and independent parts which define a slot at the apex of the V cross-section, each of said parts constituting one limb of the stabilizer;

an annular fuel injection manifold within the stabilizer and arranged to discharge fuel through said slot of the stabilizer in a counterflow direction with respect to the normal flow of gases in the engine; and

pivotal support means for mounting both said parts of said stabilizer for independent motion, said pivotal support means being mounted on said separation wall at the downstream end thereof.

4,592,201

TURBOFAN MIXED FLOW EXHAUST SYSTEM

Donald J. Dusa, Cincinnati; Andrew P. Kuchar, and Guy K. Faust, both of West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 397,321, Jul. 12, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 604,413

Int. Cl.[4] F02K *1/38*

U.S. Cl. 60—262 **8 Claims**

1. A turbofan engine including:

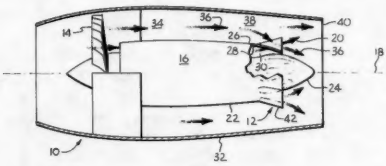
a fan;

a core engine disposed downstream from said fan and coaxially therewith about an engine longitudinal axis;

a core cowl disposed circumferentially about said core engine;

an exhaust centerbody extending from an aft end of said core engine and spaced radially inwardly from an inner surface of said core cowl to define a core nozzle for discharging gases from said core engine; and

a nacelle disposed circumferentially about said fan and core engine and spaced radially outwardly from said core cowl to define an annular bypass duct for channeling fan air downstream from said fan, said nacelle cooperating with an aft end of said core cowl for defining an annular fan nozzle for discharging fan air from said bypass duct, said nacelle extending downstream from said aft end of said



core cowl for defining an exhaust nozzle for discharging both said fan air from said fan nozzle and said gases from said core nozzle;

wherein said exhaust centerbody comprises:

an annular member having a radially outer surface including forward, intermediate, and aft portions coaxially disposed about a longitudinal axis of said member, said aft portion of said outer surface being inclined radially inwardly in an aft direction from said intermediate portion, said intermediate portion being corrugated, so as to form a plurality of circumferentially spaced grooves and ridges therein, each of said grooves and ridges extending substantially axially in said intermediate portion.

4,592,202

THRUST AUGMENTOR

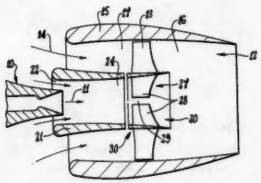
Derwent G. Stewart, Upper Beaconsfield, and Samuel A. Fisher, Ashburton, both of Australia, assignors to Commonwealth of Australia, Australia

Filed Feb. 14, 1984, Ser. No. 580,452

Claims priority, application Australia, Feb. 15, 1983, PF8040

Int. Cl.⁴ F02K *3/04, 3/00*

U.S. Cl. 60—264 **3 Claims**



1. Thrust augmentation apparatus for use with a high temperature, high speed rocket exhaust gas jet from a rocket nozzle including: a mass flow augmentor for creating an increased thrust augmenting air flow in an annular region surrounding the rocket exhaust gas jet; an augmentor drive arrangement including an inner augmentor housing having a forwardly directed inlet mouth and a passage therethrough for receiving the rocket exhaust gas jet, the diameter of the passage being greater than the outer diameter of the rocket exhaust gas jet, so that a minor air flow of ambient air is drawn into the passage through the inlet mouth by the rocket exhaust gas jet, the diameter of the passage being greater than the outer diameter of the rocket exhaust gas jet, so that a minor air flow of ambient air is drawn into the passage through the inlet mouth by the rocket exhaust gas jet and mixes with a part of the rocket exhaust gas jet to create mixed minor air flow of lower temperature than the rocket exhaust gas jet which mixed minor air flow passes through the passage, the augmentor drive arrangement further including drive means projecting inwardly into the passage and terminating radially outward of the longitudinal axis of the passage, the drive means being arranged to encounter the mixed minor air flow but not the high temperature rocket exhaust gas jet; the mass flow augmentor including an outer augmentor housing having a passage therethrough, the outer augmentor housing being arranged coaxially with and outwardly of the inner augmentor housing so as to define an annular space between the inner and outer augmentor housings for said thrust augmenting air flow, the mass flow augmentor further including a plurality of fan blades arranged within said annular space and extending in a radial direction relative to the axis of the rocket exhaust gas jet; said drive means being operably coupled to the fan blades of the mass flow augmentor so that the mixed minor air flow reacts with the drive means to provide driving energy for the drive means which in turn drives the fan blades of the mass flow augmentor to cause them to rotate and thereby create said thrust augmenting air flow in said annular region.

4,592,203

HYDRO-DYNAMIC TRANSMISSIONS

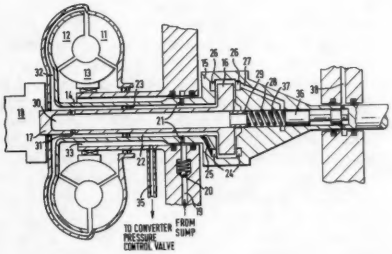
Peter W. R. Stubbs, Hampton Magna, United Kingdom, assignor to BL Cars Limited, London, England

Filed Nov. 18, 1982, Ser. No. 442,741

Claims priority, application United Kingdom, Nov. 24, 1981, 8135391

Int. Cl.⁴ F16D *33/06*

U.S. Cl. 60—358 **7 Claims**



1. A hydro-dynamic transmission including a driving part and a driven part, which parts are moveable relative to one another and transmit motion from one to the other by means of momentum imparted to fluid, including a positive displacement pump, said pump being operable to charge said driving part and said driven part with fluid and to circulate fluid in said hydrodynamic transmission for cooling purposes, and said pump being connected to said driving part and to said driven part in such manner as to have an operating speed proportional to the speed of said driving part relative to said driven part to match said cooling to heat generated, and including means for restricting flow through said pump operable to substantially stall said pump whereby to substantially prevent relative rotation of said driving part and said driven part.

4,592,204

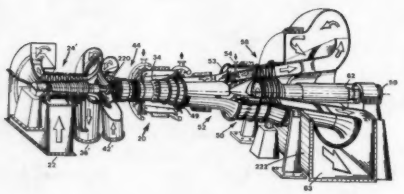
COMPRESSION INTERCOOLED HIGH CYCLE PRESSURE RATIO GAS GENERATOR FOR COMBINED CYCLES

Ivan G. Rice, P.O. Box 233, Spring, Tex. 77383

Continuation-in-part of Ser. No. 486,334, Apr. 19, 1983, Pat. No. 4,545,187, Ser. No. 486,336, Apr. 19, 1983, Ser. No. 486,495, Apr. 19, 1983, Pat. No. 4,543,781, Ser. No. 416,171, Sep. 9, 1982, abandoned, Ser. No. 416,172, Sep. 9, 1982, abandoned, Ser. No. 416,173, Sep. 9, 1982, Ser. No. 416,275, Sep. 9, 1982, Pat. No. 4,507,914, Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, and Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, said Ser. No. 486,334, Ser. No. 486,336, and Ser. No. 486,495, each is a continuation-in-part of said Ser. No. 416,171, Ser. No. 416,172, Ser. No. 416,173, Ser. No. 416,275, Ser. No. 274,660, Ser. No. 224,496, Ser. No. 47,571, and Ser. No. 954,838, Oct. 26, 1978, Pat. No. 4,272,953, said Ser. No. 416,171, Ser. No. 416,172, Ser. No. 416,173, and Ser. No. 416,275, each is a continuation-in-part of said Ser. No. 274,660, Ser. No. 224,496, Ser. No. 47,571, and Ser. No. 954,838, said Ser. No. 274,660, is a division of said Ser. No. 47,571, said Ser. No. 224,496, is a division of said Ser. No. 954,838, This application Jan. 20, 1984, Ser. No. 572,548

Int. Cl.[4] F02C *3/10, 7/143*

U.S. Cl. 60—39.161 **21 Claims**



1. An open cycle axial flow turbo hot gas generator assembly of modular construction for generating a hot gas at a bakc pressure above atmospheric with essentially an axial movement of the working fluid past any row of moving blades comprising:

a. A cylindrically shaped sectionalized outer casing to retain and direct the flow of said working fluid and to provide structural integrity of said gas generator assembly,

b. An air intake at one end of said casing,

c. A low pressure axial flow compressor mounted in said casing, connected directly to said intake to receive air therethrough and having a plurality of rows of moving blades whereof there is given flow pitchline radius of r_2 and wherein the torque transmitted to overhung rotating parts of said low pressure compressor and the rotating forces thereof are carried by a single axle style bearing and stub shaft arrangement.

d. A low pressure compressor discharge air housing connected to said casing and forming part of said casing with at least one radial discharge flange for discharging said low pressure compressor heated air to an external intercooling means,

e. A low pressure return air housing removably connected and fitted to said low pressure discharge housing forming part of said casing with at least one radial return air flange for receiving cooled air from said external intercooling means,

f. A high pressure axial flow hollow compressor mounted in said casing, connected directly to said return air housing having a plurality of rows of moving blades and variable stator blades whereof there is a given flow pitchline radius r_3 wherein said flow pitchline radius r_2 of said low pressure compressor is substantially greater than that of said radius r_3 of said high pressure compressor and wherein the RPM of said high pressure compressor is substantially greater than that of said low pressure compressor,

g. Combustion apparatus mounted in said casing and connected directly to said high pressure compressor to receive the air compressed by said high pressure compressor and wherein the temperature of said working fluid is elevated by burning a fuel therein,

h. An axial flow high pressure turbine having an open hub with at least one stage mounted in said casing and connected to said combustion apparatus therefrom and drivingly connected to said high pressure compressor by means of a hollow shaft passing axially through said combustion apparatus, the power developed being substantially wholly absorbed by said high pressure compressor,

i. An axial flow low pressure turbine with at least one stage mounted in said casing connected directly to said high pressure turbine to receive the exhaust therefrom and drivingly connected directly to said low pressure compressor by means of a short compressor stub shaft and thereto a second driving shaft passing coaxially through said high pressure turbine open hub, said high pressure hollow shaft and said high pressure hollow compressor, the power developed by said low pressure turbine being substantially wholly absorbed by said low pressure compressor,

j. An axial flow annular discharge duct and flange mounted in said casing connected directly to said low pressure turbine to receive the exhaust therefrom and to provide means for connecting thereto the hot gas generated: in which said low pressure compressor of said hot gas generator contains multiple stages to accomplish a compression ratio no greater than about 3.2 with said single bearing overhung design and in which said high pressure compressor of said hot gas generator contains multiple stages to accomplish an overall compression ratio for both low and high pressure compressors of at least about 35 and wherein said low pressure discharge housing contains a low pressure compressor discharge axial duct and radial diffuser flaring outwardly to said radial discharge flange and wherein said low pressure return housing contains an "S" shaped low pressure reverse flow return duct tucked inside and under said low pressure discharge duct wherein adequate volumetric dimensions are provided with the radii of said r_2 and r_3 and compressor stub shaft to yield a return velocity inside and return duct of about 75 feet per second therein resulting typically in a 0.25 percent pressure loss.

4,592,205

LOW PRESSURE CRYOGENIC LIQUID DELIVERY SYSTEM

Howard D. Brodbeck, Berwyn, and Martin A. Krongold, Aston, both of Pa., assignors to MG Industries, Valley Forge, Pa.

Filed Jan. 14, 1985, Ser. No. 691,386

Int. Cl.[4] F17C *13/02*

U.S. Cl. 62—49 **22 Claims**

1. Apparatus for delivery of cryogenic liquids at controlled low pressures, comprising:

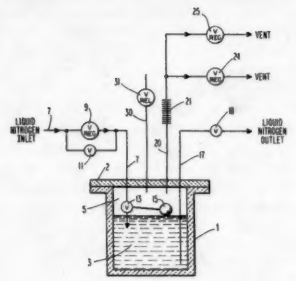
(a) first conduit means for conveying a cryogenic liquid into the apparatus,

(b) container means for storing the cryogenic liquid delivered by the first conduit means,

(c) means for maintaining a substantially constant level of cryogenic liquid in the container means, the level being chosen such that the liquid occupies less than the entire space within the container means,

(d) pressure regulator valve means, connected for actuation only by the pressure of the gas in the space within the

container above the cryogenic liquid, for regulating the gas pressure in said space above the liquid, and



(e) second conduit means for conveying cryogenic liquid out of the apparatus.

4,592,206

ROOM-WARMING/COOLING AND HOT-WATER SUPPLYING HEAT-PUMP APPARATUS

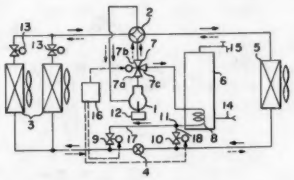
Kisuke Yamazaki, Kamakura; Michio Otsubo, Fujisawa, and Keiko Okuma, Machida, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,128

Claims priority, application Japan, Feb. 9, 1984, 59-23245; May 9, 1984, 59-94892; May 10, 1984, 59-94963; May 15, 1984, 59-99187; May 15, 1984, 59-99188; Jun. 13, 1984, 59-124084; Oct. 12, 1984, 59-214903; Oct. 23, 1984, 59-224772; Oct. 30, 1984, 59-230603; Oct. 30, 1984, 59-230604

Int. Cl.⁴ F25B *13/00, 27/00*

U.S. Cl. 62—160 **16 Claims**



1. A room-warming/cooling and hot-water supplying heat-pump apparatus comprising a refrigerant circuit provided with a compresser, a four-way valve for switching room warming and cooling operations, a room side heat exchanger, a reversible flow type expansion device and an outdoor side heat exchanger, characterized in that a first switching means is connected to the outlet side of said compressor; a first branch of said switching means is connected to said four-way valve and a second branch of said first switching means is connected to one end of a heating coil in a hot water tank; the other end of said heating coil extends out of said hat water tank and has a branched part, wherein a pipeline including said branched part has both ends connected to said refrigerant circuit at both sides of said expansion device in which at least one valve means is provided in said pipeline including said branched part and said first switching means and said valve means are controlled by a control device.

4,592,207

AIR CONDITIONING SYSTEM FOR MOUNTING ON MOTOR VEHICLES

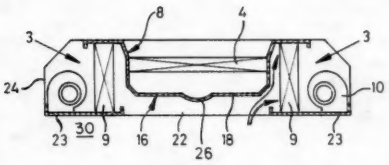
Wolfram Rummel, Saebenerstr, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,290

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420533

Int. Cl.⁴ B60H *3/04*

U.S. Cl. 62—244 **20 Claims**



1. An air conditioning system for roof mounting on a motor vehicle, having a condenser part which comprises a condenser block with a large surface that is downwardly inclined in a direction that, in an installed condition of the system, corresponds to a forward driving direction of the motor vehicle, and condenser blowers for discharging condenser exhaust; and evaporator part which comprises evaporator blocks extending, at a distance from each other, in parallel to a direction which, in said installed condition, corresponds to said forward driving direction, and evaporator blowers for supplying air to a passenger interior area of the vehicle, after its passage through the evaporator part; wherein the condenser part is arranged between evaporator blocks of the evaporator part, in such a way that an uppermost edge of the condenser block is approximately flush with an upper edge of the evaporator block, and with a trough-shaped housing part transversely separating the evaporator part from the condenser part in a manner providing an air inlet space for admission of air from the interior area of the vehicle to said evaporator blocks.

4,592,208

HEATING OR COOLING APPARATUS

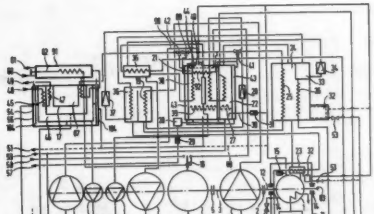
Robert Söllner, and Robert Söllner, both of Sieglstrasse 15, A-6200 Jenbach, Austria

Continuation of Ser. No. 459,593, Jan. 20, 1983, abandoned. This application May 16, 1985, Ser. No. 734,824

Claims priority, application PCT Int'l Appl., Feb. 3, 1982, PCT/AT82/00003

Int. Cl.⁴ F25B *27/02*

U.S. Cl. 62—323.1 **7 Claims**



1. In a heating or cooling apparatus of the type including a housing having therein at least one heat pump, an internal combustion engine for driving said heat pump, a heating cir-

cuit, and means for transferring heat from said engine and said heat pump to said heating circuit, the improvement comprising:

means for preventing gas leaking from said heat pump from contacting said engine and comprising an enclosure surrounding said engine in a gas-tight manner;

said engine including a crankshaft and a flywheel connected thereto, said crankshaft and flywheel being entirely enclosed within and surrounded by said enclosure;

drive means for transmitting rotation of said crankshaft to drive said heat pump, said drive means comprising a shaft separate from said crankshaft and connected to said heat pump, said shaft extending rotatably through said enclosure, means for sealing said shaft with said enclosure, and transfer means for imparting rotational movement from said crankshaft to said shaft, thereby driving said heat pump; and

means for resiliently suspending said engine in said enclosure.

4,592,209

DISPLAY COUNTER FOR FOOD PRODUCTS, REFRIGERATED BY FORCED VENTILATION

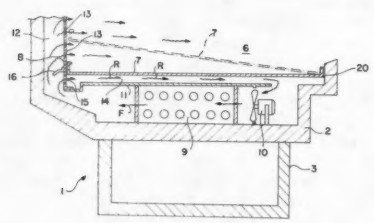
Giuseppe Casanova, Trichiana, and Ivano De Zolt, Bribano, both of Italy, assignors to Costan S.p.A., Limana, Italy

Filed May 21, 1985, Ser. No. 736,356

Claims priority, application Italy, May 23, 1984, 21898/84[U]

Int. Cl.[4] A47F *3/04*

U.S. Cl. 62—255 **4 Claims**



1. A refrigerated display counter comprising a tank, an inner tank, with a floor defining a display surface, disposed within the said tank, an interspace between the tank and the said floor, a cold air distribution duct connected to a refrigeration unit and opening into the said inner tank onto the said display surface, characterised in that it includes an opening in the said cold air distribution duct in fluid communication with the said interspace, and deflector members in the said duct, disposed in proximity to the said opening, said floor being rotatably supported along one of its sides and being adjustably positionable along an opposite side within the said inner tank.

4,592,210

AIR CONDITIONER

Shoji Hirayama, Yamato, Japan, assignor to Hirayama Setsubi Kabushiki Kaisha, Kanagawa, Japan

Filed Apr. 8, 1985, Ser. No. 720,802

Int. Cl.[4] F25D *21/14*

U.S. Cl. 62—288 **5 Claims**

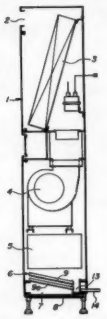
1. An air conditioner comprising:

an air conditioner body having a heat exchanger, a blower and a main filter disposed in flow series therein;

an air diffuser located in said air conditioner body on a side of said main filter opposite from said blower for diffusing air out of said body and into a room;

an air intake port disposed substantially in the bottom of said air conditioner body for taking air into said body from said room;

a drain pan disposed beneath said heat exchanger and above said air intake port for collecting liquid dripping from said heat exchanger, said drain pan comprising an upper and a lower plurality of substantially U-shaped trough members, wherein each lower trough member is substantially coplanar with the other lower trough members and is spaced from adjacent lower trough members by a first pre-determined interval, wherein each upper trough member is substantially co-planar with the other upper trough members and is spaced from adjacent upper trough members by a second pre-determined interval, wherein said upper and lower trough members are staggered such that each upper trough member overlaps a corresponding first pre-determined interval between two lower trough members and each lower trough member overlaps a corresponding second pre-determined interval between two upper



trough members, and wherein said upper members are spaced vertically from said lower trough members, such that said spacings between said trough members collectively form an air passage through said drain pan;

a drain passage for conveying liquid collected by said drain pan out of said air conditioner body, said drain pan being obliquely mounted and having openings formed at the lower ends of said trough members opening into said drain passage such that liquids collected in said drain pan will drain by gravity into said drain passage; and

a drive mechanism attached to upper ends of at least one of said upper and lower pluralities of trough members for driving said upper ends upwardly and downwardly, said at least one plurality of trough members being mounted pivotally at said lower ends thereof.

4,592,211

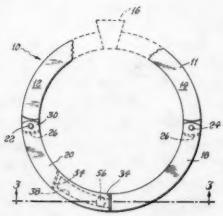
EXPANDABLE FINGER RING

Bernard Ross, 190 Franklin Ave., Island Park, N.Y. 11558

Filed May 30, 1984, Ser. No. 615,153

Int. Cl.[4] A44C *9/02*

U.S. Cl. 63—15.5 **1 Claim**



1. An expandable finger ring or the like comprising:

an upper segment portion,

means pivotaily connecting said segment portion at its free ends to,

first and second expander sections,

said second expander section including a longitudinal extension extending toward said first expander section in which a rigidly closed slot continuously converging in a direction from the free end of said extension toward the pivotal connection of said second expander section, is formed,

said first expander section carrying a stud and provided with a longitudinal recess across which said stud is disposed and in which said extension is slidingly received,

the transverse dimension of said stud being slightly greater than the narrowest slot dimension, and wherein said stud will tightly abut the walls defining said slot when said ring is contacted and thereby releasably hold said expander sections together,

whereby said ring circumference is expandable and contractable for placement on a wearer's finger or limb.

4,592,212

CIRCULAR KNITTING MACHINE FOR THE PRODUCTION OF CUT PILE

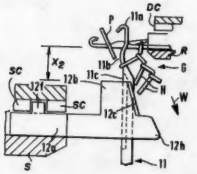
Walter R. Schmidt, Dr. Gschmeidler-Str. 19/2, 3500 Krems/-Donau, Australia

Filed Dec. 21, 1982, Ser. No. 451,863

Claims priority, application Austria, Dec. 22, 1981, 5512/81

Int. Cl.[4] D04B *9/12, 35/00*

U.S. Cl. 66—91 **15 Claims**



3. A knitting machine for producing cut pile fabric, said machine including a dial and cylinder together with a plurality of needles and pile forming elements, respectively, said pile forming elements each having a pile loop forming portion at one end thereof with the shank of the pile element extending therebelow, a cutting edge formed so as to exend along said shank and cutting means positioned with respect to each said pile element so as to effect a substantially transverse slicing engagement with said cutting edge at a predetermined distance below said dial needles, said predetermined distance being able to accomodate at least one previously formed, pile loop, so that said at least one pile loop previously drawn down along the shank of the pile element can be severed by the relative movement between the cutting edge on said pile element and said cutting means but only after an additional pile loop is formed on said pile forming element so that a plurality of loops are on said pile element prior to cutting and less than all of said plurality of loops are cut.

4,592,213

PNEUMATIC FIBER RECOVERY AND REDISTRIBUTION SYSTEM FOR SLIVER HIGH PILE FABRIC KNITTING MACHINES

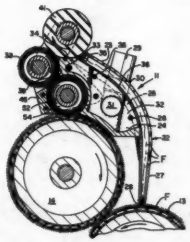
Alan L. Tilson; Earl R. Quay, both of Orangeburg, and John C. Knight, North, all of S.C., assignors to Mayer, Wildman Industries, Inc., Orangeburg, S.C.

Continuation-in-part of Ser. No. 647,632, Sep. 5, 1984, Pat. No. 4,532,780, which is a continuation-in-part of Ser. No. 539,801, Oct. 7, 1983, abandoned. This application Aug. 1, 1985, Ser. No. 761,565

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] D04B *9/14;* **D01G** *15/40*

U.S. Cl. 66—9 B **8 Claims**



1. A pneumatic fiber recovery and redistribution device for sliver high pile fabric knitting machines for returning fibers from the doffer to the main cylinder of a fiber transfer and feeding unit, said device having a suction chamber into which fibers are sucked from the doffer, fiber discharge means for discharging the fibers from the suction chamber and fiber return means disposed externally of the suction chamber for delivering discharged fibers to the main cylinder, said fiber return means being characterized by

(a) a sealing roller disposed adjacent the fiber discharge means of the suction chamber,

(b) a fiber return feed roller disposed adjacent the main cylinder for transferring fibers thereto and

(c) a fiber transfer roller interposed between the sealing roller and the fiber return feed roller for transferring fibers from the sealing roller to the fiber return feed roller,

(d) said fiber return means being operative to form the discharged fibers into a thin uniform film of aligned fibers for uniform redistribution upon the main cylinder.

4,592,214

FABRIC DRAW-OFF ROLLER ON FLAT-BED KNITTING MACHINES

Ernst Goller, Reutlingen, and Günther Kazmaier, St. Johann-Ohnastetten, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Aug. 28, 1984, Ser. No. 645,136

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1983, 3331052

Int. Cl.[4] D04B *15/88*

U.S. Cl. 66—149 R **7 Claims**

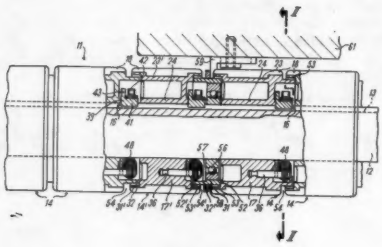
1. A fabric draw-off roller, in particular for flat-bed knitting machines, comprising:

a shaft; and

a plurality of roller elements mounted in side-by-side relationship on the shaft, each roller element being mounted to turn relative to each other a predetermined amount, wherein:

(i) at least two adjacent roller elements of said plurality of roller elements each has: a casing having an outer surface and an axial bore at one end of the casing, which defines an inner surface of the casing and an annular end face; and an axially extending distance spacer at the other end of the

casing having an annular end face and an outer surface with a diameter less than the diameter of the inner surface defined by said bore to produce a circular gap between the outer surface of the spacer and the inner surface of the axial bore of an adjacent roller element;



(ii) the axial length of the distance spacer being greater than the axial length of said bore with the annular end face of the distance spacer abutting the annular end face of the bore of an adjacent roller element to produce an axially extending gap between the outer surfaces of adjacent casings outer surfaces; and

(iii) the axial gap communicating with the circular gap.

4,592,215

CIRCULAR-KNITTING MACHINE

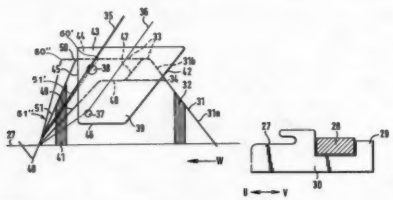
Alfred Beck, Hechinger Strasse 10, 7407 Rottenburg 21, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 546,898, Oct. 31, 1983, abandoned. This application Sep. 16, 1985, Ser. No. 776,986

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240370

Int. Cl.[4] D04B *9/38, 15/54*

U.S. Cl. 66—216 **18 Claims**



1. A device for a circular-knitting machine for the production of a plain fabric, having a thread guide which has a front edge that is inclined relative to the running direction of the needles, a front, a rear, a rear edge, a lower edge, a first thread guide hole which is provided for a thin back thread, and a second thread guide hole which is provided for a thick pattern thread; and having a knocking over sinker with a knocking over edge, a sinker cam for moving the knocking over sinker, which is movable radially in a reciprocatable manner, a knitting curve which rises in the direction of movement of needles, the knitting curve having a first partial zone which lies in front of the front edge of the thread guide, in which zone there is disposed a needle latch opening zone, the knitting curve having a second partial zone which lies behind the thread guide; and having a latch clearing position which adjoins the knitting curve, which has a component that is parallel to the direction of movement and a thread reception position for the pattern thread; and having a first withdrawal curve which follows the latch clearing position, a thread insertion position which follows the withdrawal curve, a second withdrawal curve which follows the thread reception position and is after the thread insertion position and extends to the knocking-over position disposed beneath the knocking-over edge; and having a needle latch closing zone disposed after the rear edge of the thread guide, the second withdrawal curve lying at most partly behind the rear of the thread guide and at least in a part of the needle latch closing zone, comprising the improvement wherein:

(a) following the needle latch opening zone, the knitting curve, branching off for the needles catching the thin back thread, changes to a catching position which starts not further downstream than the front edge and has a horizontal component and changes to the thread insertion position, the old stitch, consisting of the back thread and the pattern thread, in the catching position still being disposed on the downwardly hanging latch of the needle,

(b) the latch clearing position of the needles which have the task of knitting the pattern thread extends substantially in a horizontally continuous plateau-like manner to the second withdrawal curve, which extends substantially at a first angle to the knocking-over edge, and

(c) the thread insertion position changes to a third withdrawal curve which leads to the knocking-over position and extends substantially at a second angle to the knocking-over edge, which angle is considerably smaller than the first angle to such an extent that the back thread needles do not grasp the pattern thread.

4,592,216

APPARATUS FOR CONTINUOUS WET-HEAT TREATMENT OF A CLOTH

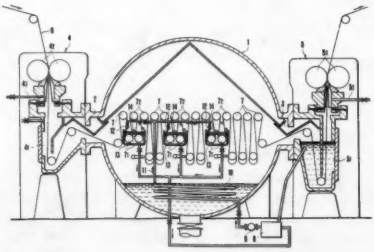
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Aug. 6, 1984, Ser. No. 637,775

Claims priority, application Japan, Aug. 10, 1983, 58-124303

Int. Cl.[4] D06B *3/12, 21/02*

U.S. Cl. 68—5 E **2 Claims**



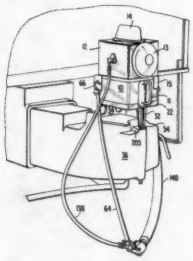
1. An apparatus for the continuous wet-heat treatment of a cloth comprising: a steamer body provided with a plurality of guide rollers for continuous transportation of a cloth to be treated therethrough with formation of up and down snake-like undulations, a plurality of water-receiving tanks for immersing the cloth repeatedly in high temperature water stored therein as the cloth undulates up and down, and a plurality of cloth-widening rollers freely floating on the water's surface of the water-receiving tanks positioned so as to contact adjacent upwardly and downwardly moving portions of the cloth on opposite sides of said cloth-widening rollers, so as to increase widening the cloth in its width direction.

4,592,217

MARKER ATTACHMENT FOR RAILROAD EQUIPMENT

Emilio A. Fernandez; Angel P. Bezos, and Gregory C. Martin, all of Rockville, Md., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed May 7, 1985, Ser. No. 731,351
Int. Cl.[4] G01L *5/28*
U.S. Cl. 73—129 20 Claims



1. An attachment for securing railroad signalling and monitoring equipment to the coupler of a railroad car, said coupler having a flag hole in the knuckle thereof, said attachment comprising:

a tray for supporting said equipment; and

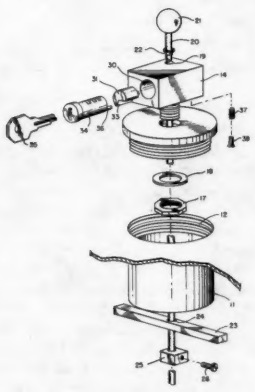
means attached to said tray for mounting said tray on the top of the coupler so that said equipment will not be damaged in the event that said coupler is engaged by another coupler, said means including a foot portion which rests on the top of the coupler knuckle and prevents swivelling of said tray, and a rod which is designed to be received and locked in said flag hole.

4,592,218

TANK CLOSURE LOCK

Dardis W. Chechovsky, P.O. Box 855, Lenoir City, Tenn. 37771, and Jackie D. Rikard, P.O. Box 534, Hardy, Ark. 72542

Filed Mar. 7, 1985, Ser. No. 709,339
Int. Cl.[4] B65D *55/14*
U.S. Cl. 70—164 8 Claims



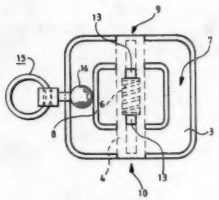
1. A tank closure lock comprising a removable tank closure cap having an opening formed therethrough, a body portion seated on the closure cap and having a depending tubular extension projecting through said opening of the closure cap, means to secure said extension within said opening and being engaged with the bottom surface of the closure cap, said body portion having a first bore formed therethrough from top to bottom and being coaxial with the bore of said tubular extension and having a second bore formed partly therethrough at right angles to the first bore and intersecting the first bore, a cable element extending movably through the first bore and said tubular extension and having a pulling handle means thereon above said body portion, a locking cross bar adjustably secured to the cable below the closure cap and being adapted to transversely bridge and engage the lower end of a splash sleeve within a tank on which the lock is installed, a rotary eccentric disposed in said second bore of the body portion and having a recess defining thereon first and second shoulders, a key-operated tumbler lock installed in the second bare behind said eccentric and having a forwardly projecting pin adapted to engage the first shoulder of the eccentric when the lock is turned by a key, and a biasing spring held on the body portion and bearing on the second shoulder of the eccentric to bias the eccentric toward gripping and locking engagement with the cable element.

4,592,219

KEYHOLDER

Herbert Richter, Pforzheim-Buechenbronn, Fed. Rep. of Germany, assignor to Herbert Richter, Metallwaren-Apparatebau GmbH & Co., Pforzheim-Buechenbronn, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 724,971
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 8500204
Int. Cl.[4] A47G *29/10*
U.S. Cl. 70—456 R 9 Claims



1. A keyholder for retaining keys in a bundle, said keyholder comprising a disc-shaped body having a circumferential recessed groove formed therein, said groove having a slot-type opening and being adapted to receive head portions of key retainers which project through the slot-type opening, a slide cavity extending centrally through said disc-shaped body and intersecting said circumferential groove with openings provided at opposite ends of said disc-shaped body such that the head portions of said key retainers may be inserted into said circumferential groove through said openings and a slide disposed in said slide cavity, said slide having a length corresponding to the length of said slide cavity extending through said body and being resiliently centered therein so as to block said openings and means for moving said slide out of its center position in said slide cavity in one or the opposite direction thereby clearing either one or the other of said openings for permitting a key retainer's insertion into, or removal from, said groove.

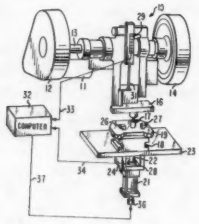
4,592,220
SYSTEM AND METHOD FOR THE IN PRESS ADJUSTMENT OF WORKPIECE HOLDING FORCE

Miguel R. Martinez; Zygmunt M. Andrevski, and William J. Mitchell, Jr., all of Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 7, 1984, Ser. No. 638,557

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—16 **16 Claims**



1. A method of optimizing the holding force on the pressure pad of a press in accordance with the formed dimension of a part and in accordance with the thickness of a workpiece to be formed into said part by said press, said press having a forming tool and a die which cooperate to form said part, a force transducer and a displacement transducer comprising the steps of:

applying an initial holding force to said pressure pad and continuously monitoring said holding force with said force transducer;

providing the thickness of said workpiece from said displacement transducer and also providing a correlation of optimum holding forces for a variety of workpiece thicknesses;

moving said forming tool to form said workpiece into said part while monitoring said force transducer and said displacement transducer; and

calculating said optimum holding force in accordance with said workpiece thickness and the output of said displacement transducer; and adjusting said holding force to one of said optimum forces.

4,592,221
METHOD OF AND AN ARRANGEMENT FOR PRODUCING THREADS

Eberhart Krueger, Mölln, and Helmut Künsken, Schwarzenbek, both of Fed. Rep. of Germany, assignors to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

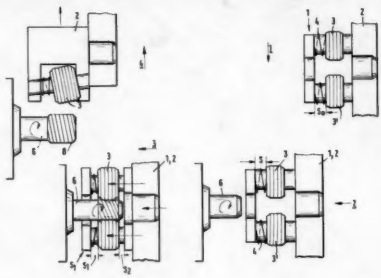
Filed Jan. 3, 1984, Ser. No. 567,785

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1983, 3300029

Int. Cl.[4] B21H *3/04*

U.S. Cl. 72—84 **7 Claims**

1. A method of producing threads on workpieces, comprising the steps of providing an axial-type thread rolling head which has two thread rolls with a plurality of discrete annular grooves and axes inclined relative to one another, and is arranged on a turret of a numerically controlled automatic lathe; bringing the thread rolling head into a rolling position by moving in transverse direction with the thread rolls being brought in a position above a center line of the workpiece; rolling a thread by axial displacement of the thread rolls relative to a workpiece; and subsequently withdrawing the thread rolls from the workpiece in tangential direction by means of the thread rolling head being moved back transversely from



the workpiece with constantly retained opposite distance of the thread rolls to one another.

4,592,222
DEVICE FOR THE DELIVERY AND REMOVAL OF THE MANDREL RODS IN SKEW AND LONGITUDINAL ROLLING MILLS

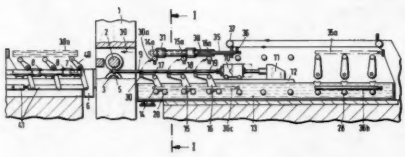
Manfred Müller, Dusseldorf; Wilhelm Nickel, Mulheim; Klaus-Peter Schirmagg, Ratingen, and Engelbert Mailander, Hensweiler, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,815

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3333390

Int. Cl.[4] B21B *17/08, 25/06*

U.S. Cl. 72—97 **5 Claims**



1. Device for the delivery and removal of mandrel rods in skew and longitudinal rolling mills between a roll stand and mandrel support with a plurality of rocking levers arranged one behind the other in the direction of rolling and which are pivotable into an upper and a lower position, on the free ends of which levers receivers are provided for receiving the mandrel rod, and which are mounted in horizontal pivot bearings extending transversely to the rolling direction and which have a pivot drive,

characterized in that the rocking levers are two-armed angle levers forming an angle of 60° to 150° therebetween with a receiver mounted on one side of both arms, the pivot axes of which, approximately at the level of the rolling axis and in the horizontal transversely to the direction of rolling, are slidably mounted in two different positions, in by drive means which in a first position the receivers stand on the angle levers in the vertical projection through the rolling axis and in the other position are offset adjacent said vertical projection through the rolling axis.

4,592,223

WIRE FORMING APPARATUS

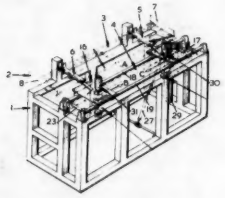
Arnold Woffendin, Colne, England, assignor to Silentnight Holdings PLC, Colne, England

Filed Oct. 5, 1984, Ser. No. 658,136

Claims priority, application United Kingdom, Oct. 12, 1983, 8327306

Int. Cl.[4] B21F *3/04, 45/00*

U.S. Cl. 72—142 9 Claims



1. Wire forming apparatus comprising a pair of rotary dies movable together and apart on a rectilinear path and adapted to hold a length of wire at opposite ends thereof such that on contra-rotation the dies approach each other while deforming said ends into coils, wherein lifting means is provided for continuously lifting a central section of the wire in a lifting direction parallel to the axes of rotation of the dies during approach movement of the dies so as to control the angle of inclination of the wire adjacent the dies with respect to the axes of rotation thereof, thereby imparting a desired pitch and height to said coils.

4,592,224

PROCESS AND DEVICE FOR EXTRUDING A HOLLOW SECTION

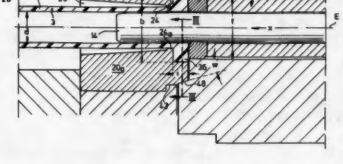
Alfred Wagner, Steisslingen, and Adolf Ames, Duchtlingen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 20, 1983, Ser. No. 563,310

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247977

Int. Cl.[4] B21C *23/08, 27/00, 25/02*

U.S. Cl. 72—264 11 Claims



1. A process for extruding by pressing through the shape-given orifice of a die a hollow section from a billet positioned in a bore in a container wherein the outline of the die orifice determines the outer contour of the hollow section and a mandrel determines the inner contour, comprising providing a die having a shape-giving orifice and a shaping recess upstream of the shape-giving orifice wherein the diameter of the recess is larger than the diameter of the container bore for forming a flange onto the extruded hollow section as an integral part thereof during the extrusion stroke and extruding said billet through said shape-giving orifice and into said recess such that the entire billet is pressed from said container.

4,592,225

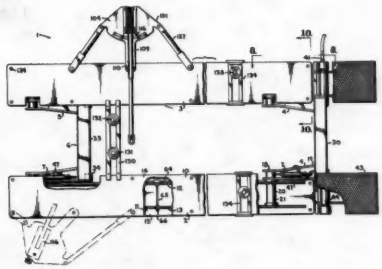
VEHICLE REPAIR AND ALIGNMENT RACK

Leonard F. Eck, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Oct. 30, 1984, Ser. No. 666,619

Int. Cl.[4] B21D *1/12*

U.S. Cl. 72—457 5 Claims



1. A mobile work rack arrangement for vehicles comprising:

(a) spaced, parallel, box means members respectively having front and rear ends, inner and outer webs, vehicle supportive upper plates and floor engaging lower plates, said box beam members being separated from each other their entire length to provide a substantially unobstructed elongate opening open at said front and rear ends;

(b) front and rear sets of legs having upper and lower ends and spaced inner and outer side plates with said upper ends connected to said beam members adjacent said inner webs by pivot means, said pivot means including respective outer tubes extending between and secured to said inner and outer webs in each of said box beam members, and inner tubes pivotally received in each of said outer tubes, extending therethrough and protruding inwardly with said leg upper ends secured thereto;

(c) cross beams extending laterally between opposite said front and rear sets of legs at said lower ends thereof; said cross beams generally engaging the floor, and providing structural connection and rigidity between said box beam members to substantially prevent lateral movement of said box beam members upon application of tensile force therebetween;

(d) fluid power rams pivotally mounted and extending between said box beam members and said legs and generally receivable between said leg spaced side plates; said fluid power rams being operable to swing said legs upwardly to move said box beam members against the floor and swing said legs downwardly to raise said box beam members above the floor;

(e) at least one of said legs upper ends extending beyond said pivot means and having a plurality of teeth thereon;

(f) lock means selectively engaging said teeth for locking an angular position of said legs with respect to said beam members;

(g) said box beam members having a plurality of apertures positioned about the periphery thereof and said front and rear ends; and

(h) at least one force applying structure mountable to said beam members and including a base, a ram structure extending upwardly therefrom, a tongue projecting from said base and having spaced ends for pinning to said box beam member apertures and spaced side braces extending angularly outwardly from said base and pinned to said box beam member apertures, said force applying structure

being movable about said beam members by removing and repositioning same on said beam members by pinning.

4,592,226

ROTATIONAL VISCOSIMETER

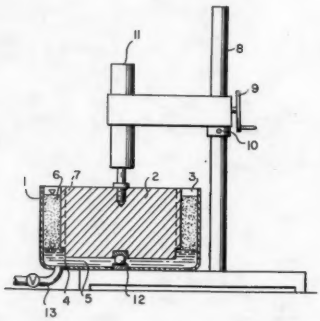
Manfred Weber, and Mehmet Dedegil, both of Karlsruhe, Fed. Rep. of Germany, assignors to NUKEM GmbH, Hanu, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 744,562

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423579

Int. Cl.[4] G01N *11/14*

U.S. Cl. 73—59 **9 Claims**



1. A rotational viscosimeter for ascertaining the flow properties of flowable mixture containing coarse particle components, especially of concrete mixtures, comprising a driving means having a torque measuring device operatively connected therewith, a pot and a rotatable inner cylinder centrally journaled in the pot, said inner cylinder being provided with a lower lip, an annular gap between the inner cylinder and the pot which is at least five times larger than the largest particle diameter of the solids in the mixture to be measured in the annular gap, a sealing liquid at least up to the lower lip thereof and having a density at least 1.5 times that of the heaviest components of the mixtures, not miscible with the mixture and not reactable therewith and wherein at least one of the outer surface of the inner cylinder and the inner surface of the pot above the level of the sealing liquid has a roughened surface.

4,592,227

APPARATUS FOR ANALYSIS OF BLOOD

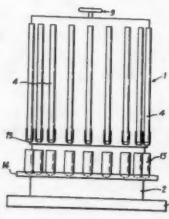
Gérard Poncept, 10, Chemin de Dalibray, Gaillonnet par Serain-court 95450 - Vigny, France

Filed Dec. 12, 1983, Ser. No. 560,477

Claims priority, application France, Dec. 17, 1982, 82 21221

Int. Cl.[4] G01N *15/05, 33/49*

U.S. Cl. 73—61.4 **4 Claims**



1. Apparatus for determining corpuscle sedimentation rates comprising, first support means supporting a plurality of graduated tubes having upper and lower ends, said tubes being held vertically and spaced apart horizontally on said first support means, second support means supporting a plurality of containers having open upper ends and closed lower ends and being of a size such that the lower ends of said tubes can be inserted into the containers for receiving blood samples, said containers being held generally vertically and spaced apart horizontally on said second support means such that said containers are in respective alignment with said tubes, said first and second support means being movable with respect to each other to a first position in which the tubes on the first support means are spaced from the containers on the second support means, a second position in which the lower ends of the tubes on the first support means extend into the containers on the second support means, and a third position in which sedimentation of blood within said graduated tubes can occur, suction means for applying a suction to the upper ends of said tubes to draw blood samples into the tubes from said containers when said support means are in said second position, and seal means for sealing the lower ends of the tubes to prevent loss of blood samples from said tubes when said support means are in said third position, said seal means comprising a tubular elastic sleeve mounted on the lower end of each of the tubes, and extending downwardly from the lower ends of the tubes, wherein said first support means is moved downwardly from said second position to said third position, and means in said containers for deforming the tubular elastic sleeves to seal the lower ends of the tubes in said third position of the support means, said suction means maintaining suction in said tubes at least until said support means are moved to said third position.

4,592,228

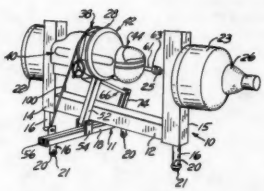
TRANSMISSION TESTER

Carroll J. Lucia, 2703 Bay Settlement Rd., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 493,301, May 10, 1983, Pat. No. 4,520,659. This application Dec. 4, 1984, Ser. No. 678,101

Int. Cl.[4] G01M *13/02*

U.S. Cl. 73—118 **36 Claims**



1. A transmission testing apparatus comprising a support base, at least one upright member disposed at an end of said support base, a shaft journalled through said upright member, an inertia flywheel supported by said shaft for rotation thereby, an adjustably positionable bulkhead, an internal combustion engine mounted on one side of said bulkhead, said engine having an output shaft, a transmission support plate rotatably attached to said bulkhead for affixing thereto a transmission to be tested, said transmission having an output shaft and an input shaft aligned with the output shaft of said internal combustion engine for coupling to the output shaft of said internal combustion engine, means for displaceably and adjustably supporting said bulkhead relative to said support base for aligning the output shaft of said transmission with said shaft supporting said inertia flywheel, means for adjustably positioning said bulkhead, means for maintaining said engine in an angular position relative to horizontal and vertical axes that remains substantially constant irrespective of the position of said bulkhead, and means for coupling the output shaft of said transmission shaft to said shaft supporting said inertia flywheel.

4,592,229

DEVICE FOR MEASURING PRESSURES AND VARIATIONS OF PRESSURE WITH TIME

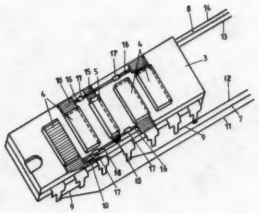
Karl-Aloys Bütefisch, Bovenden, and Horst Ahlbrecht, Göttingen, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Lutf- und Raumfahrt EV, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,721

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337978

Int. Cl.[4] G01M *9/00*

U.S. Cl. 73—147 4 Claims



1. Device for measuring pressures and variations of pressure with time at the surface of test objects, for example wind tunnel models, test vehicles and aircraft, comprising a plurality of pressure-sensitive sensors arranged on a carrier, wherein the pressure-sensitive sensors (4) are to be arranged flush with the surface in the carrier (3) and the latter is to be arranged with the sensors (4) flush with the surface of the test object (1) at the test location, in the carrier (3) an operational amplifier (18) is provided for each sensor (4), the underside of each sensor (4) is connected via as short a line (10) as possible to its associated operational amplifier (18), at the carrier (3) connections (4, 11) are provided for supplying the operational amplifiers (18) and for conducting the output signals and all topsides of the sensors (4) are connected to each other and to a combined ground connection (5) of the operational amplifiers (18) thru an electrically conductive coating (6).

4,592,230

APPARATUS FOR AND METHOD OF DETERMINING THE LIQUID COOLANT LEVEL IN A NUCLEAR REACTOR

James P. Waring, Rockville, and Robert D. Smith, Bethesda, both of Md., assignors to Scandpower, Inc., Bethesda, Md.

Filed Jul. 18, 1983, Ser. No. 514,600

Int. Cl.[4] G01F *23/00*

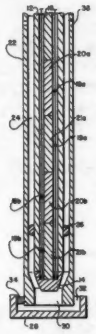
U.S. Cl. 73—295 9 Claims

1. An instrument for measuring liquid level within a liquid containing vessel comprising:

an elongated body having a longitudinal axis extends into a liquid containing vessel in a generally vertical direction;

a plurality of difference thermocouples arranged within said elongated body, each said difference thermocouple comprising a heated and unheated junction; and

electrical heating means formed of electrically conductive materials which comprise high and low heating materials located in alternate zones along the length of said elongate body, the electrical heating means comprising a single slender rod which extends down the length of the elongated body parallel to the longitudinal axis, whereby the heated junction of each said difference thermocouple is heated by one zone of high heating material located adjacent to the heated junction, and the unheated junction of



each of said difference thermocouple is located adjacent to one zone of low heating material.

4,592,231

DEVICE FOR THE ELECTRIC MEASUREMENT OF A LIQUID LEVEL

Bernhard Kant, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 620,888

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321562

Int. Cl.[4] G01F *23/24, 23/26*

U.S. Cl. 73—295 7 Claims

1. A device for the electric measurement of the level of a liquid contained within a container, having a conductive foil such as a temperature-dependent, externally electrically heated resistance foil immersed in the liquid and surrounded by a protective tube, the total resistance of which foil, detectable by an evaluation circuit, is dependent on the level of the liquid in the container, or having a capacitance foil bearing two conductors which form a capacitor, the conductive or capacitive foil being developed in strip shape and being held within the protective tube by holding elements acting on at least one of its longitudinal edges in such a manner that both of its surfaces can be washed over by the liquid, the improvement wherein

the conductive or capacitive foil has radial incisions distributed over its length and is held, twisted around its longitudinal axis, between the holding elements of the protective tube,

the protective tube is a corrugated tube,

said protective tube comprises a set of corrugations, each of said corrugations extending circumferentially part-way around the tube from a beginning of the corrugation to an end of the corrugation; and

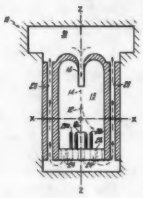
the holding elements are produced in each case by an interruption of a corrugation, in the manner that a wall section of an inwardly directed corrugation, which wall section corresponds at least to the thickness of the conductive or capacitive foil is extended up to the diameter of an outer corrugation between the beginning of a corrugation and the end of a corrugation.

4,592,232

ANGULAR VELOCITY SENSOR

E. Marston Moffatt, Glastonbury, and Richard E. Swarts, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1984, Ser. No. 608,001
Int. Cl.[4] G01P *3/26*
U.S. Cl. 73—505 **1 Claim**



1. Angular velocity sensor means, comprising:

housing means, for enclosing a jet chamber having a reference jet axis and having nozzle means disposed at one end of said chamber for discharging a fluid jet along said reference jet axis;

fluid delivery means, for delivering a fluid under pressure to said nozzle to form said fluid jet;

sensor means, having first and second pairs of wire sensing elements disposed symmetrically, at an opposite end of said chamber, about said reference jet axis in a first plane perpendicular thereto, said first and second pairs positioned on first orthogonal axes of said first plane, said sensing elements of each pair being cooled differentially, in response to deflection of said fluid jet from said reference jet axis in the presence of sensor rotation about a rotaion axis lying in a second plane parallel to said first plane, in proportion to anglar velocity components of said sensor rotation resolved about second orthogonal axes lying in said second plane, each of said second orthogonal axes being parallel to a corresponding one of said first orthogonal axes, each of said wire sensing elements having resistance values which vary according to the amount of cooling received by each, each mounted across an associated pair of posts such that each mounted wire sensing element is parallel to the other wire element in its associated pair, said posts having sharp chisel shaped tips for mounting an exact length of wire between each associated pair of posts; and

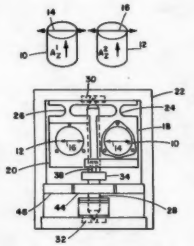
detector circuit means, responsive to said sensing elements' resistance values for providing signals indicative to said angular velocity components of said sensor's velocity of rotation resolved about said component axes.

4,592,233

ANGULAR BASE SENSOR UTILIZING PARALLEL VIBRATING ACCELEROMETERS

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation of Ser. No. 528,773, Sep. 2, 1983, abandoned. This application May 28, 1985, Ser. No. 737,913
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—510 **11 Claims**



1. An apparatus for generating a signal representing the angular rate motion of a structure, comprising:

a first accelerometer, carried by the structure, for generating a first output signal representing acceleration along a first force-sensing axis;

a second accelerometer, carried by the structure, for generating a second output signal representing acceleration along a second force-sensing axis;

alignment means for aligning said first and second accelerometers relative to the structure in a side by side relationship with said first force-sensing axis parallel to said second force-sensing axis;

vibration means, operatively connected to the structure and said alignment means, for vibrating said first and said second accelerometers in opposite directions toward and away from each other along collinear vibration axes which are normal to said force-sensing axes at a predetermined frequency, whereby the force and torque applied to the structure by said vibration means is balanced; and

signal processing means, responsive to said first and second output signals, for generating a rate signal representing the angular rate motion of the structure about an axis perpendicular to the plane defined by said force-sensing axes and said vibration axis and for generating a force signal representing the acceleration of the structure along said force-sensing axes.

4,592,234

SUSPENSION SYSTEM FOR A TRANSDUCER

Brian L. Norling, Seattle, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jun. 11, 1984, Ser. No. 619,021
Int. Cl.[4] G01P *15/13*
U.S. Cl. 73—517 B **28 Claims**

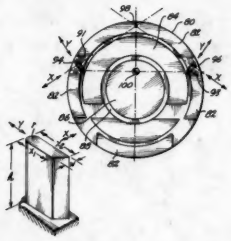
1. A transducer comprising:

a proof mass including a mass element suspended from a support member for movement with respect thereto;

a stator means for supporting said proof mass; and

mounting means for mounting the proof mass to the stator means, the mounting means including at least one pliant element positioned to provide a mechanical connection between adjacent points on the proof mass and the stator means, the pliant element having a pliant axis and being

substantially rigid along axes orthogonal to the pliant axis, such that the pliant element deforms to provide relative



movement between the proof mass and the stator means due to displacements such as thermal strains.

4,592,235

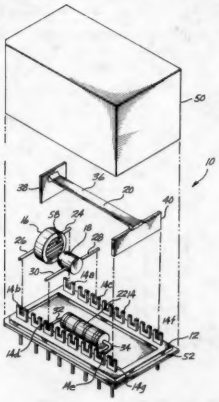
OPTICAL ACCELEROMETER

Lawrence E. Fink, 13029 SE. 189th Ct., Renton, Wash. 98055

Filed Nov. 18, 1983, Ser. No. 553,081

Int. Cl.[4] G01P *1/02, 15/08*

U.S. Cl. 73—517 R **2 Claims**



1. A solid state accelerometer, comprising:

light responsive means for producing an electrical signal proportional to light intensity;

an LED spaced from and directed to emit light toward said light responsive means;

a shutter plate positioned between said light responsive means and said LED;

a cantilever beam having a first end connected to said shutter plate and a second end fixed to a support, said support enabling said cantilever beam to deflect in response to acceleration forces acting on the beam and the shutter plate, and to move the shutter plate to vary the amount of light received by said light responsive means from the LED as a function of acceleration; and

mounting means including a base member having first and second sides and a plurality of conductive members, each conductive member extending through a separate socket opening in the base member and each having a terminal portion on the first side of the base member and a projecting pin portion on the second side of the base member, said projecting pin portion being insertable into another socket opening in a printed circuit board, wherein said light responsive means, said LED and said cantilever beam are connected to said mounting means, and wherein the support fixed to the second end of said cantilever beam includes a first end connected to the terminal portion of a conductive member, and a second end connected to the terminal portion of another conductive member.

4,592,236

CONTAINER MONITORING SYSTEM USING ULTRASONIC SEALS

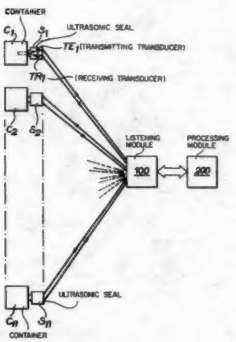
Gianpietro Battagin, Angera; René Denis, Laveno; Guilio Ghiringhelli, Angera, all of Italy; Alain Beaubron; Phillippe Guay, both of Dijon, and Alfred Schaal, Massy, all of France, assignors to Communate Europeenne de l'Energie Atomique (Euratom), Luxembourg, Luxembourg and Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 15, 1982, Ser. No. 450,013

Claims priority, application France, Dec. 22, 1981, 81 23997

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—602 **4 Claims**



1. A system for monitoring a plurality of containers using ultrasonic seals integral with said containers and electronic means connected to these seals, wherein:

(A) each seal comprises an ultrasonic transmitting transducer and an ultrasonic receiving transducer making it possible to check both an acoustic identity of a marking and an integrity of the seal,

(B) the electronic means connected to these seals comprise:

(a) at least one cyclic, sequential module for the auscultation or listening to the seals having the same number of outputs and inputs as there are seals, the outputs being connected to the transmitting transducers and the inputs to the receiving transducers,

(b) at least one electronic processing module connected to the listening module and controlling a sampling of the signal received,

wherein the seal listening module comprises:

a timing circuit having three outputs respectively supplying a timing pulse, a synchronizing pulse and a delayed pulse;

a transmitting circuit having the same number of transmitters as there are seals to be checked, each transmitter being connected to the transmitting transducer of a seal, said circuit having an addressing input connected to an addressing bus from the processing module and carrying an addressing signal and a control input connected to the timing circuit and receiving the synchronizing pulse;

a receiving circuit having the same number of inputs as there are seals to be checked, each input being connected to the receiving transducer of a seal and an output supplying a detected signal;

a digital sampler having a signal input connected to the

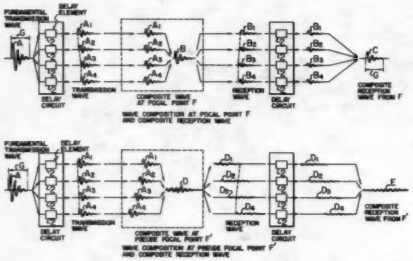
output of the receiving circuit and a first control input receiving the delayed pulse determining the sampling time, a second control input controlling a measurement, a first output connected to a bus carrying the digital value of the sample and a second output connected to a connection carrying a pulse, when sampling is ended.

4,592,237

METHOD OF SELECTING COMPOSITE RECEPTION SIGNAL IN ULTRASONIC INSPECTION APPARATUS AND APPARATUS THEREFOR

Satoshi Ogura, Hitachi; Sakae Sugiyama, Ibaraki, and Kazunori Koga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,834
Claims priority, application Japan, May 12, 1983, 58-81797
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—602 **6 Claims**



1. An ultrasonic inspection method in which ultrasonic waves respectively transmitted from a plurality of vibrator means are reflected by a reflector in a test piece of produce reflection waves and said reflection waves are received as reception signals composed into a composite signal, said method comprising the steps of:

detecting a first composite signal based on the reflection waves from a focal point in a main lobe at a first time point at which said first composite signal can be detected;

detecting a second composite signal based on the reflection waves from a pseudo focal point in said main lobe at a second time point in advance of said first time point;

detecting a third composite signal based on the reflection waves from said pseudo focal point in said main lobe at a third time point which is later than said first time point; and

deciding that the first composite signal is based on the reflection waves from a position of an inspection target when only said first composite signal is detected.

4,592,238

LASER-RECRYSTALLIZED DIAPHRAGM PRESSURE SENSOR AND METHOD OF MAKING

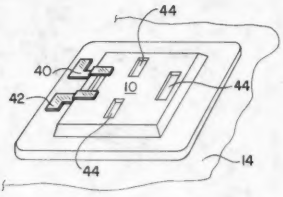
Heinz H. Busta, Park Ridge, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 15, 1985, Ser. No. 723,015
Int. Cl.[4] G01L *7/08, 9/06*
U.S. Cl. 73—727 **26 Claims**

1. A pressure sensor comprising:

a diaphragm and an overpressure stop opposed from one another,

said diaphragm and overpressure stop having a gap therebetween for displacement of said diaphragm in response to an applied pressure,



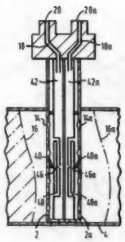
said diaphragm being formed of laserrecrystallized polycrystalline silicon.

4,592,239

FLOWMETER

George D. Cutler, Weymouth, United Kingdom, assignor to Tekflo Limited, Dorset, United Kingdom

Filed Aug. 9, 1984, Ser. No. 639,254
Claims priority, application United Kingdom, Aug. 10, 1983, 8321482
Int. Cl.[4] G01P *5/16*
U.S. Cl. 73—861.66 **3 Claims**

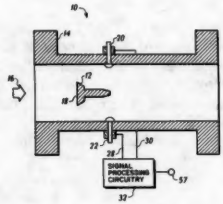


1. A flowmeter comprising an elongate upstream facing probe insertable across a stream of fluid, said probe defining longitudinally spaced impact ports disposed along the probes length, said probe defining at least two internal impact chambers, some of said impact ports communicating with one impact chamber and other impact ports with a said second impact chamber, an internal averaging impact pressure chamber, a first conduit leading from said one impact chamber to said averaging impact chamber, a second conduit leading from said second impact chamber to said averaging impact chamber, said impact ports so dimensioned as to restrict the flow within said impact chambers so that the pressure within the averaging impact chamber represents the average impact pressure across the flow profile, means for measuring the average impact pressure in said averaging impact chamber, a downstream facing probe having static ports disposed along the length of said probe, said static probe defining at least two internal static chambers, some static ports communicating with one static chamber and other static ports communicating with said second static chamber, an internal averaging static pressure chamber, a first static conduit leading from said one static chamber to said averaging static chamber, a second static conduit leading from said second static chamber to said averaging static chamber, and means for measuring the average static pressure.

4,592,240
ELECTRICAL-CHARGE SENSING FLOWMETER

Edward J. McHale, Medfield, and Wade M. Mattar, Wrentham, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Oct. 7, 1983, Ser. No. 539,769
Int. Cl.⁴ G01F *1/32*
U.S. Cl. 73—861.22 **19 Claims**



1. In a conduit having a moving fluid passing therethrough, wherein said moving fluid contains naturally occurring electrical charges that flow with said fluid, an apparatus for measuring the flow velocity of the moving fluid comprising:

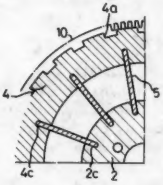
modulating means for periodically producing fluidic sub-flows at a generating rate proportional to said flow velocity; and

sensor means for responding to the electrical charges in each of said fluidic sub-flows and producing therefrom a sensor signal having frequency corresponding to said generating rate of the fluidic sub-flows.

4,592,241
TORQUE DETECTOR

Hideki Obayashi, Okazaki; Tokio Kohama, Nishio; Toshikazu Ina, Nukata, and Seiichi Narita, Chiryu, all of Japan, assignors to Nippon Soken, Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Sep. 7, 1983, Ser. No. 529,865
Claims priority, application Japan, Sep. 8, 1982, 57-156358; Feb. 22, 1983, 58-28776; Feb. 22, 1983, 58-28777; May 10, 1983, 58-81397; May 30, 1983, 58-95407
Int. Cl.⁴ G01L *3/10*
U.S. Cl. 73—862.34 **13 Claims**



1. A torque detector for detecting torque of a driving shaft of an internal combustion engine when the driving shaft is connected to a load, comprising:

(1) a first rotating body which is coaxially and integrally connected to the driving shaft;

said first rotating body having a substantially circular plate-shape and including a boss which projects therefrom;

(2) a second rotating body, connected to the load, and arranged around said first rotating body so as to be coaxial therewith;

said second rotating body having an annular plate-shape and being disposed around said boss so as to be coaxial therewith, in the vicinity of and substantially parallel with said first rotating body;

(3) an elastic member for connecting said first rotating body to said second rotating body in the radial direction, said elastic member including a plurality of elastic plates which are radially disposed between said boss of said first rotating body and said second rotating body, said elastic plates being deformed in accordance with the load applied to said second rotating body when said first rotating body is rotated;

the ends of each of said elastic plates being connected to said boss of said first rotating body and said second rotating body respectively;

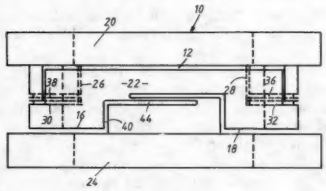
(4) angular phase difference detecting means for detecting an angular phase difference between said first rotating body and said second rotating body which occurs due to the deformation of said elastic member; and

(5) torque computing means for calculating torque from said angular phase difference.

4,592,242
DYNAMICALLY TUNED GIMBAL SUSPENSION WITH FLEXURAL PIVOTS FOR A TWO-DEGREE-OF-FREEDOM GYRO

Hagen Kempas, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Gerätetechnik GmbH, Überlingen, Fed. Rep. of Germany

Filed Apr. 12, 1983, Ser. No. 484,134
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213720
Int. Cl.⁴ G01C *19/22*
U.S. Cl. 74—5 F **3 Claims**



1. In a dynamically tuned gimbal suspension for supporting a gyro rotor with two degrees of freedom, comprising

(a) a first generally hollow-cylindrical ring,

(b) a second generally hollow-cylindrical ring arranged coaxially to said first ring with a common axis, said rings defining an axial direction and a peripheral direction and having a first end and a second end,

(c) said first ring having a first and a second pair of axially spaced generally peripheral cuts,

(d) each pair of said generally peripheral cuts of said first ring defining therebetween a pair of diametrically opposite, peripherally extending bending springs,

(e) the pair of bending springs defined by said first pair of cuts of said first ring being angularly offset by 90° relative to the pair of bending springs defined by said second pair of cuts,

(f) said second ring having a third and a fourth pair of axially spaced, generally peripheral cuts,

(g) each pair of said generally peripheral cuts of said second ring defining therebetween a pair of diametrically opposite, axially extending bending springs,

(h) the pair of bending springs defined by said third pair of cuts of said second ring being angularly offset by 90° relative to the pair of bending springs defined by said fourth pair of cuts,

(i) said first and second pairs of cuts of said first ring dividing said first ring into a first ring portion adjacent said first end, a second ring portion adjacent said second end and a median first gimbal portion therebetween, said first ring portion being separated from said median first gimbal portion by said first pair of cuts and flexibly connected

thereto through the pair of bending springs defined by said first pair of cuts, and said second ring portion being separated from said median first gimbal portion by said second pair of cuts and flexibly connected thereto through the pair of bending springs defined by said second pair of cuts,

(j) said third and fourth pairs of cuts of said second ring dividing said second ring into a third ring portion adjacent said first end, a fourth ring portion adjacent said second end and a median second gimbal portion therebetween, said third ring portion being separated from said median second gimbal portion by said third pair of cuts and flexibly connected thereto through the pair of bending springs defined by said third pair of cuts, and said fourth ring portion being separated from said median second gimbal portion by said fourth pair of cuts and flexibly connected thereto through the pair of bending springs defined by said fourth pair of cuts,

(k) the bending springs defined by said first pair of cuts of said first ring being arranged crosswise to the bending springs defined by said third pair of cuts of said second ring, and the bending springs defined by said second pair of cuts of said first ring being arranged crosswise to the bending springs defined by said fourth pair of cuts of said second ring,

(l) said first ring portion and said third ring portion being interconnected to form a gimbal for connection to a gyro rotor and

(m) said second ring portion and said fourth ring portion being interconnected to form a gimbal for connection to gyro rotor driving means,

the improvement comprising:

(n) the cuts of said first pair of cuts of said first ring being symmetric with respect to a first plane passing through said axis, and being provided on opposite sides of said first ring,

(o) the cuts of said second pair of cuts of said first ring being symmetric with respect to a second plane passing through said axis and orthogonal to said first plane, and being provided on opposite sides of said first ring,

(p) each of said cuts of said first pair comprising a peripheral median portion near said first end, axial portions of equal lengths at both ends of said median portion communicating therewith and extending therefrom in generally axial direction towards said second end, and peripheral end portions communicating with one of said axial portions,

(q) each of said cuts of said second pair comprising a peripheral median portion near said second end, axial portions of equal lengths at both ends of said median portion communicating therewith and extending therefrom in generally axial direction towards said first end, and peripheral end portions communicating with one of said axial portions,

(r) with each pair of said first and second pair of cuts, the ends of the axial portions of one cut being axially offset relative to the ends of the axial portions of the other cut, and the adjacent peripheral end portions of the cuts overlapping in peripheral direction, whereby said peripherally extending bending springs are leaf springs formed between said overlapping peripheral end portions,

(s) the cuts of said third pair of cuts of said second ring being symmetric with respect to said first plane and being provided on opposite sides of said second ring,

(t) the cuts of said fourth pair of cuts of said second ring being symmetric with respect to said second plane and being provided on opposite sides of said second ring,

(u) each of said cuts of said third pair comprising a peripheral median portion, which extends through slightly less than 180° near said first end, and axial end portions of equal lengths at both ends of said median portion communicating therewith and extending therefrom in an axial direction toward said second end,

(v) each of said cuts of said fourth pair comprising a peripheral median portion, which extends through slightly less than 180° near said second end, and axial end portions of equal lengths at both ends of said medial portions communicating therewith and extending therefrom in an axial direction toward said first end, and

(w) with each pair of said third and fourth pair of cuts, the axial end portions of one cut being slightly, peripherally spaced from the adjacent axial end portion of the other cut, whereby said axially extending bending springs are leaf springs formed between said adjacent axial end portions.

4,592,243

REDUCTION TYPE STARTER

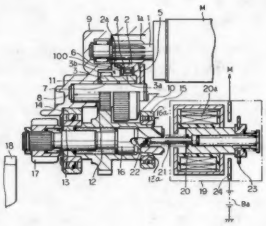
Kazunori Katoh, and Yasuhiro Nagao, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 24, 1984, Ser. No. 613,405

Claims priority, application Japan, Jun. 20, 1983, 58-110401; Mar. 13, 1984, 59-48375

Int. Cl.⁴ F02N *15/06*

U.S. Cl. 74—7 E **7 Claims**



1. A reduction type starter comprising:

a starter housing;

a starter motor having a motor shaft;

a motor gear formed on said motor shaft;

a pinion drive shaft rotatably and slidably supported by said housing;

a pinion attached to one end of said pinion drive shaft;

a drive gear operatively coupled to said pinion drive shaft;

an idle shaft fixed to said housing and in parallel with said motor shaft and said pinion drive shaft; and

an over-running clutch provided on said idle shaft, said clutch having an outer ring formed with a first reduction gear being engaged with said motor gear, said clutch also having an inner ring formed with a second reduction gear being engaged with said drive gear.

4,592,244

DEVICE FOR RECIPROCALLY DRIVING A SHAFT

Tomizou Nagata; Kouzou Sakakibara, and Makoto Sakano, all of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,323

Claims priority, application Japan, Jun. 13, 1984, 59-120007

Int. Cl.⁴ F16H *25/12, 53/08*

U.S. Cl. 74—57 **8 Claims**

1. A driving device for reciprocating a shaft along an axial direction thereof, comprising:

a supporting base for slidably supporting the reciprocating shaft along the axial direction thereof;

a guide groove drum rotated relative to said supporting base and having at least one annular guide groove with at least one intersection on a circumferential surface thereof; and

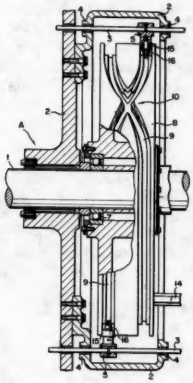
a driven member fixed to said reciprocating shaft and engaged with said guide groove,

said driven member having a cam follower and a boat-shaped member rotatable about an axis extending from said driven member to said guide groove,

said boat-shaped member having a cam roller rotatable

about another axis extending from said driven member to said guide groove, and

said guide groove having a cam follower guide path engaged with said cam follower, a cam roller guide path engaged with said cam roller and a boat-shaped member guide path



engaged with said boat-shaped member at the intersection thereof,

whereby when said guide groove drum and said supporting base are rotated relative to each other, said reciprocating shaft is reciprocated by engagement of said driven member and said guide groove.

4,592,245

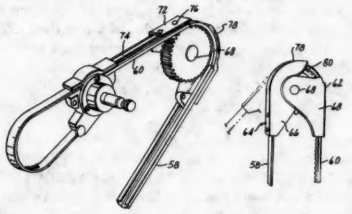
WINDOW REGULATOR HAVING C-SHAPED GUIDE AND FLEXIBLE TAPE WITH RACK TEETH

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Jul. 28, 1983, Ser. No. 517,979

Int. Cl.[4] E05F *11/48*

U.S. Cl. 74—89.21 **5 Claims**



1. Apparatus for converting rotary motion to linear motion comprising an elongated relatively thin flat tape having at one side a series of transversely extending rack teeth terminating short of the edges of the tape to leave smooth guide surfaces, an elongated operationally rigid but bendable guide of generally C-shaped cross-section having a bottom and side walls, in-turned spaced apart retainer flanges at the edges of said side walls engageable with the smooth guide surfaces at the edges of the tape and defining a longitudinally extending opening at which the rack teeth of said tape are exposed, a bracket secured to said guide, a drive pinion carried by said bracket in mesh with said rack teeth, a connector on said tape movable along said opening as said tape is moved longitudinally in said guide, in which said apparatus is a window regulator for raising and lowering the window of a motor vehicle, said guide comprising a substantially vertical lift portion and an angularly disposed drive portion on which said pinion bracket is mounted, said guide portions being interconnected by arcuate guide means comprising hinge structure of two parts, each part being secured to a different one of said guide portions to provide for bringing the guide portions into substantial parallelism.

4,592,246

INFINITELY VARIABLE TRANSMISSION

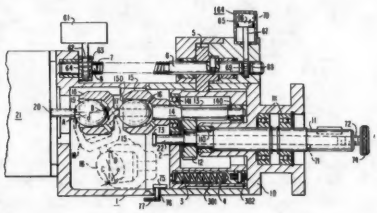
Detlev Hofmann, Hauptstr. 79, 7531 Kieselbronn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 198,669, Oct. 20, 1980, abandoned. This application Dec. 7, 1983, Ser. No. 558,823

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942076

Int. Cl.[4] F16H *15/00*

U.S. Cl. 74—190 **14 Claims**



1. An infinitely variable transmission comprising a housing; input and output shafts rotatably supported in said housing, each of said shafts having an axis; at least one pair of friction members which are pivotal relative to each other, and one being operatively connected to said input shaft, and the other to said output shaft for the transmission of motion therebetween, one of said friction members being a conical sleeve and the other being an ellipsoidal member received in said conical sleeve and being in frictional engagement therewith; a support disc mounted in said housing for rotation about an axis which is spaced from the axis of at least one of said input and output shafts and having one of said friction members eccentrically supported therein for rotation about an axis spaced from the axis of said support disc; means for forcing said friction members toward, and into frictional engagement with, one another; and control means associated with said support disc for rotating said disc for changing the motion transmission ratio between said input and output shafts.

4,592,247

CONTINUALLY ADJUSTABLE BALL-TYPE PLANETARY GEAR SET

Günter Mutschler, Biberach, Fed. Rep. of Germany, assignor to Neuweg Fertigung GmbH, Munderkingen, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,912

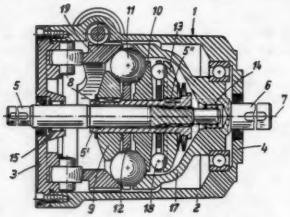
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335445

Int. Cl.[4] F16H *15/26, 57/00, 13/06, 15/50*

U.S. Cl. 74—198 **3 Claims**

1. A continually adjustable ball-type planetary gear set, comprising a housing; a driving shaft and a driven shaft supported in said housing for rotation about a common axis; a first race ring mounted on the driving shaft for joint rotation therewith, a second race ring mounted to the driven shaft for joint rotation therewith, said first and second race ring being positioned at an adjustable axial distance from each other; a first guide ring arranged on said driving shaft for free rotation about said common axis and opposite to said first race ring; a second guide ring arranged on said driving shaft for free rotation about said common axis and opposite to said second race

ring, said first guide ring and second guide ring being positioned at an adjustable axial distance from each other; a plurality of rolling bodies; said first race ring, said second race ring, said first guide ring and said second guide ring having raceways limiting an annulus in which said rolling bodies run while engaging the raceways of said race rings and guide rings, the axial distance between said second race ring and said second guide ring being adjustable in accordance with a desired ratio between the number of revolutions of the driven shaft and the number of revolutions of the driving shaft; a sleeve mounted



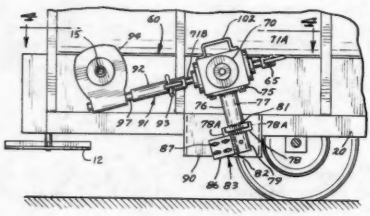
on said driving shaft for joint rotation therewith, said first race ring being arranged on said sleeve for joint rotation therewith, said driving shaft having an end portion which is provided with a toothing which connects said driving shaft with said sleeve in a locking rotation—fixed fashion, said driving shaft having a remaining portion which is surrounded by said sleeve with a play so as to allow for a slight radial movement of said sleeve relative to said driving shaft whereby raceways of said first race ring and said first guide ring are adjusted to said rolling bodies thus reducing wear and vibrations of said rolling bodies and said first race and guide rings.

4,592,248

QUICK CHANGE GEAR BOX MOUNTING KIT FOR GROUND DRIVE IMPLEMENT

Glen L. Strand, Murdock, Minn., assignor to TCI, Inc., Benson, Minn.

Filed Dec. 30, 1983, Ser. No. 567,091
Int. Cl.⁴ F16H *1/14*
U.S. Cl. 74—417 **9 Claims**



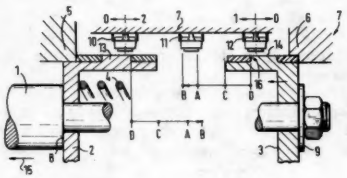
1. A gear box mounting for a bevel gear box having first and second selectively driven shafts at 90° to each other and lying on a first plane, which shafts rotate at a different ratio when one or the other of the shafts is driven, comprising first and second telescoping members capable of rotation relative to each other about an axis and being movable to telescope along the axis, a gear box support on one of said telescoping members to support a gear box with the first axis perpendicular to the first plane of a supported gear box, means to mount a second of said telescoping members in position on a machine to position a gear box on the gear box support to form a drive through such a gear box mounted to the gear box support between two shafts on a machine on which the mounting is placed, and cooperating releasable latch means on the telescoping members engageable at first and second different rotational positions of the telescoping members at 90° to each other to prevent rotation of the telescoping members relative to each other in each position, a gear box supported on the gear box support being retained in position to have its shafts drivably coupled to two shafts on a machine on which the telescoping members are supported, said latch means being released when a supported gear box is manually lifted to telescope the telescoping members along the axis from the first position to permit rotation of a supported gear box to the second position of the telescoping members with a supported gear box in a second position positioned for coupling to shafts of a machine on which the support is mounted.

4,592,249

SHIFT ROD POSITION INDICATION SYSTEM

Ulrich Lehmann, Weissach, and Hans Weigele, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing.-H.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 600,817
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314111
Int. Cl.⁴ G05G *9/12;* B60K *23/00;* H01L *43/08*
U.S. Cl. 74—473 R **8 Claims**



1. A shift rod position indicator system for an automotive vehicle transmission having at least one gear set operated by a shift rod, comprising:

a plurality of sensors fixed to a housing of the transmission in spaced relation to each other; and

actuating means moved by the shift rod for actuating the sensors;

wherein said sensors and actuating means are arranged such that a first electrical signal is produced when the shift rod is operated so as to partially engage the gear set, and a second electrical signal is produced when the shift rod is operated so as to fully engage the gear set.

4,592,250

HYDROMECHANICAL TRANSMISSION WITH SPLIT TORQUE AND REGENERATIVE TORQUE FLOW PATHS

David B. Plasencia, Northville, and Stewart P. Maxwell, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

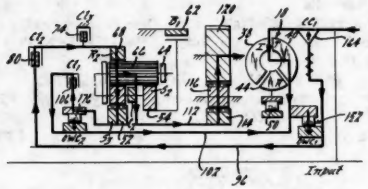
PCT No. PCT/US83/01591, § 371 Date Oct. 11, 1983, § 102(e) Date Oct. 11, 1983, PCT Pub. No. WO85/01785, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 11, 1983, Ser. No. 557,294
Int. Cl.⁴ F16H *47/08, 3/74, 57/10;* F16D *33/00*
U.S. Cl. 74—688 **6 Claims**

1. A hydrokinetic torque converter mechanism for an automotive vehicle driveline adapted to deliver driving torque from a driving shaft to an output shaft;

a compound planetary gear unit having two input elements, a reaction element, separate torque input shafts connected respectively to said input elements;

said hydrokinetic unit comprising a bladed impeller and a bladed turbine, the impeller being connected to said driving shaft, said turbine being connected to one of said input shafts;

a centrifugally operated clutch means for connecting a second input shaft to said driving shaft and an overrunning



coupling between the output side of said centrifugally actuated clutch and said first input shaft.

4,592,251

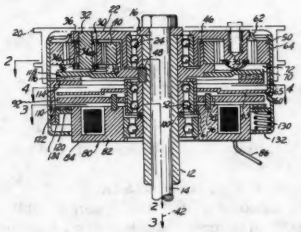
TWO SPEED ACCESSORY DRIVE

Murray R. Mason, Kent Bridge, Canada, assignor to Canadian Fram Limited, Ontario, Canada

Filed Mar. 25, 1983, Ser. No. 478,757

Int. Cl.[4] F16H 57/10

U.S. Cl. 74—785 **7 Claims**



5. A two speed drive comprising:

a driving member;

a rotatable driven member coaxially positioned relative to the driving member;

planetary gear means rotatable with said driving member and with said driven member for providing in one condition a non-reducing speed drive and for providing in a second condition a speed reducing drive therebetween, said gear means including a sun gear drivingly engaging said driving member, a ring gear mounted for rotation about said driving member, a plurality of planetary gears interconnecting said sun gear and said ring gear, and drive hub means for supporting said sun gear relative to said driving member, said driven member attached to and carried with said planetary gears;

electromagnetic clutch means, operable in a first mode for simultaneously driving said sun gear and said ring gear in said one condition to establish a non-reducing speed drive and operable in a second mode to rotationally lock said ring gear for driving said driven member through said sun gear and said planetary gears at a speed less than the speed of the driving member, including:

a clutch plate attached to and rotatable with said drive hub means, the extreme portions of said clutch plate supporting a first friction face;

a clutching member rotationally movable with said ring gear and axially movable relative to said driving member and said ring gear, said clutching member movable in an axial direction in response to magnetic forces and movably urged in an opposite direction by clutch springs to cause a frictional engagement with said friction face to permit said ring gear to rotate with said driving member; and

a drum circumferentially positioned about and rotatable with said ring gear, said drum rotationally supported relative to said driving member by a retainer which rotates with said drum and said ring gear and wherein said clutching member is fitted to and rotationally carried with said retainer such that when said clutching member has moved in said axial direction it is rotationally fixed thereby rotationally fixing said ring gear, said drum and retainer, and

wherein said clutching member includes a plurality of axially extending members connected for axial movement relative to and rotatable with an inner surface of said drum, said axially extending members interdigitating with recesses formed in said retainer, said axially extending members supporting an annular inwardly directed member, positioned proximate said clutch plate and upon which is secured friction material for engagement with said clutch plate and another friction material and wherein said electromagnetic clutch further includes an armature rotationally fixed and axially movable in response to the magnetic field during the second mode for frictionally engaging said another friction material to prevent said clutching member from rotating and wherein said clutching member comprises another annular inwardly extending member carrying thereon said another friction material.

4,592,252

ROLLING CUTTERS FOR DRILL BITS, AND PROCESSES TO PRODUCE SAME

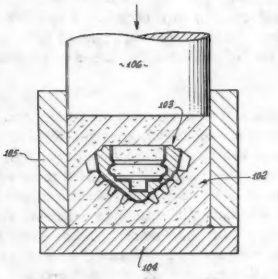
Gunes M. Ecer, Irvine, Calif., assignor to CDP, Ltd., Newport Beach, Calif.

Division of Ser. No. 633,508, Jul. 23, 1984, Pat. No. 4,562,892.

This application Jun. 12, 1985, Ser. No. 743,816

Int. Cl.[4] B22F 7/08

U.S. Cl. 76—108 A **43 Claims**



1. The method of producing a roller bit cutter, that includes the steps

(a) providing a tough, metallic, generally conical and fracture resistant core having a hollow interior, the core defining an axis,

(b) providing an annular, metallic, radial bearing layer carried by said core at the interior thereof to support the core for rotation, said bearing layer extending about said axis,

(c) providing a wear resistant outer metallic layer on the exterior of the core,

(d) the core including metallic teeth integral with the core and protruding outwardly therefrom, at least some of said teeth spaced about said axis,

(e) and providing an impact and wear resistant layer on each tooth to provide hard cutting edges as the bit cutter is rotated about said axis,

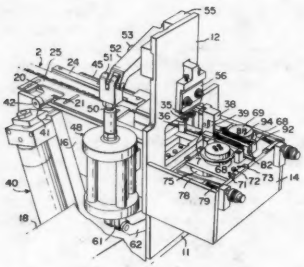
(f) at least one of said core and layers being provided by application of powder metal in a suitable binder, the binder subsequently volatilized and the powder metal consolidated in a granular bed via which pressure is transmitted to said metal powder.

4,592,253

APPARATUS FOR PREPARING THE END OF A SHIELDED FLAT CABLE

John G. Hatfield, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 30, 1985, Ser. No. 728,722
Int. Cl.[4] H02G 1/12
U.S. Cl. 81—9.51 3 Claims



1. Apparatus for preparing the end of a shielded flat multiconductor cable for termination, the cable comprising a plurality of side-by-side insulated conductors surrounded by a conductive shield which is surrounded by a continuous insulative outside jacket, the cable having opposed side edges and opposed external surfaces extending therebetween, the apparatus comprising

a base,

a pair of coplanar rotary cutting blades mounted for rotation on respective axes which are fixed relative to said base, said blades being spaced to impinge opposed side edges of said shield when said cable is passed therebetween,

cable guide means between said blades comprising a pair of parallel mutually facing elongate arcuate channels profiled to closely receive respective side edges of said cable on a first path therein, each said channel having a lead-in, a first portion proximate said lead-in profiled to receive an edge of the jacket closely therein, a second portion remote from said lead-in profiled to receive the edge of the shield therein, and a shoulder between said portions which acts as a lead-in to said second portion and further serves as a stop for the end of the jacket, each said channel having an elongate slot therein in the deepest part thereof, the edges of said rotary cutting blades protruding through said slots at a first position and into respective second portions of said channels only sufficiently to cut through said shield

said guide means being movable relative to said base parallel to the cable axis so that said cutting blades protrude through said slots at a second position and into said first portions adjacent said shoulders, whereby

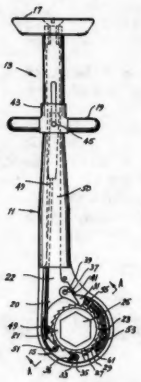
upon moving said free end of a cable having the outside jacket stripped therefrom to expose the shield between the end of the jacket and the free end of the cable into said lead-in until said end of said jacket abuts said shoulder while said blades protrude through respective slots at said first position, and upon further moving said cable so that said guide moves until said blades protrude through respective slots at said second position, said blades will cut the side edges of said shield to the end of said jacket.

4,592,254

RATCHET WRENCH

Frederick A. Wallis, 9 Mosaic Street, Shelley, Western Australia, Australia

PCT No. PCT/AU83/00067, § 371 Date Jan. 18, 1984, § 102(e) Date Jan. 18, 1984, PCT Pub. No. WO83/04208, PCT Pub. Date Dec. 8, 1983
PCT Filed May 24, 1983, Ser. No. 579,882
Claims priority, application Australia, May 24, 1982, PF4122
Int. Cl.[4] B25B 13/46
U.S. Cl. 81—57.39 4 Claims



1. A tool for turning a rotatable element, said tool comprising:

a body having a drive head and a handle;

said handle including a fixed handle portion and a movable handle portion being movable between a first position and a second position positioned with respect to the fixed handle portion;

said movable handle portion being slidably mounted on said handle in a single hand grip relationship so that movement along a length of said handle is effected to said movable handle portion by a single hand while said fixed handle portion is simultaneously being gripped by said single hand;

an annular engaging member rotatably mounted in the drive head with its inner face defining a multi-walled socket for receiving the rotatable element, said engaging member including a plurality of ratchet teeth around its outer perimeter;

a pair of axially spaced side plates rotatably mounted in the drive head co-axial with the engaging member;

an elongated member coupled to said movable handle portion and coupled to said side plates at an outer radial surface of said side plates for partially rotating said side plates by movement of said movable handle portion;

spring means for resisting the rotation of said side plates;

said movable handle portion being operatively coupled to said elongated member so that movement of the movable handle portion from the first position to the second position effects rotational movement of the side plates and said spring means moving the side plates and returning the movable handle portion to said first position;

a first pawl mounted on said side plates to engage the ratchet teeth and effect rotation of the engaging member when said side plates are rotated by the movable handle portion; and

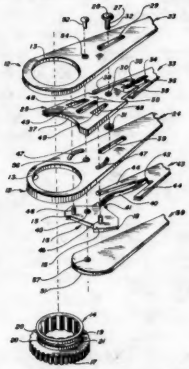
a second pawl mounted on the body to engage the ratchet teeth and prevent rotation of the annular engaging member as said side plates are returned to an original position under the action of said spring means.

4,592,255

RATCHET WRENCH WITH MULTIPLE TOOLS

Albin F. Mayer, 2920 Pilot Knob Rd, Eagan, Minn. 55121

Continuation of Ser. No. 563,998, Dec. 21, 1983, abandoned.
This application Aug. 13, 1985, Ser. No. 765,364
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—63 **13 Claims**



1. A ratchet wrench and removable tool combination comprising:

a handle member having a circular opening therethrough, proximate an end thereof, and having an interior slot opening into said circular opening;

a slidable finger in said interior slot, said slidable finger having a pair of elongate slots extending generally parallel to said interior slot opening;

an elongated opening in said handle member, extending generally parallel to said interior slot for a predetermined distance, said elongated opening thereby creating an elongated slot opening into said interior slot;

a pin affixed at one of its ends to said slidable finger and extending through said elongated slot; said pin being movable in said slot from a first position whereby said slidable finger extends into said circular opening, to a second position whereby said slidable finger is retracted from said circular opening;

a pivotable ratchet pawl mounted to said handle member; a pair of arcuate openings in said handle member between said slidable finger and said ratchet pawl and a pair of raised pins on said ratchet pawl, each of said pins extending through one of said arcuate openings and into one of said elongate slots in said slidable finger;

said removable tool comprising a cylindrical portion sized for fitting through said circular opening in said handle member, said cylindrical portion having a circumferential groove for receiving said slidable finger in said pin first position; and a toothed portion for engagement by said ratchet pawl.

4,592,256

COMBINATION RATCHET AND SPINNER WRENCH

Raul A. Bosque, 9029 Scott St., Bellflower, Calif. 90706

Filed Jan. 22, 1985, Ser. No. 693,056
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.29 **16 Claims**

1. An improved combination ratchet and spinner wrench comprising:

(a) a front housing having a longitudinal housing bore extending therethrough, a drive shaft bore located normal to the longitudinal housing bore and a fixed internal circumference annular ratchet gear on the inside front end of said housing,

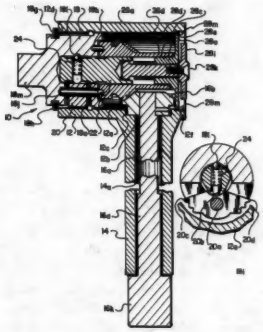
(b) a handle having a spinner shaft bore therethrough that is aligned with the drive shaft bore on said front housing and where front end of said handle is rigidly attached to said front housing,

(c) a spinner drive shaft assembly having on its top end a rigidly attached primary bevel gear and on its bottom end a spin knob where when said shaft is inserted into the drive shaft bore on said handle the primary bevel gear is located within said front housing and the spin knob extends beyond the bottom end of said handle,

(d) a ratchet/spinner assembly positioned within the longitudinal housing bore on said front housing where said assembly comprises:

A. a rotatable housing subassembly further comprising:

(1) an integral socket shank that extends beyond front of said subassembly and beyond the end of said front housing,



(2) a three-position pawl having an ON detent position on one end, an OFF detent position on the other end and a center NEUTRAL position, where the two pawl ends are designed to selectively engage the annular ratchet gear on said front housing in two of its three positions where its center is a neutral position allowing said pawl to be selectively disengaged from the internal ratchet gear,

B. means to selectively place said three-position pawl in either of its three positions,

C. a secondary bevel gear subassembly positioned within the longitudinal housing bore on said front housing and designed to mesh with the primary bevel gear on said spinner drive shaft, and,

D. a pawl indexing and connecting shaft that connects said rotatable housing subassembly with said secondary bevel gear subassembly.

4,592,257

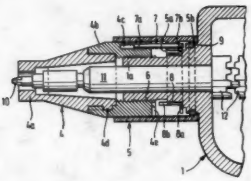
HAND-HELD SCREW DRIVING DEVICE WITH ADJUSTABLE DEPTH STOP

Paul Dürr, Ulisbach, Switzerland, assignor to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Continuation of Ser. No. 552,487, Nov. 16, 1983, abandoned.
This application Sep. 16, 1985, Ser. No. 776,993
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242862
Int. Cl.[4] B25B *23/00*
U.S. Cl. 81—429 **10 Claims**

1. Hand-held device for driving screws into a receiving member or material comprising a housing having a front end and an opposite rear end with the axial driving direction of the screw being in the rear end-front end direction and outwardly from the front end, a depth stop axially adjustably mounted at the front end of said housing, thread means located on said depth stop and said housing for direct threaded engagement between said depth stop and said housing for adjustably interconnecting said depth stop to said housing, and an actuating

sleeve located on and extending between said depth stop and said housing for adjustably positioning said depth stop in the axial direction relative to said housing, said actuating sleeve being axially displaceable relative to said housing between an adjusting position and an adjusted position, said actuating sleeve being selectively engageable with said housing in the adjusted position so that it does not rotate relative to said housing, means for interconnecting said actuating sleeve with said depth stop in the adjusting and adjusted position so that said actuating sleeve does not rotate relative to said depth stop when said depth stop is axially adjusted relative to said housing and is displaceable in the axial driving direction relative said depth stop, to catch means located on said housing and said actuating sleeve and said catch means in the adjusted position



selectively engaging said actuating sleeve and said housing so that said actuating sleeve does not rotate relative to said housing and in the adjusting position where said actuating sleeve is disengaged relative to said housing and is axially displaced from and rotatable along with said depth stop relative to said housing while said depth stop remains in threaded engagement with said housing, said catch means comprises a spring ring fitted on said housing and a shoulder formed on said actuating sleeve and movable over and into locking engagement with said spring ring, and said interconnecting means comprises an axially extending securing pin in axial parallel relation with the driving direction and mounted on said actuating sleeve and engaged with said depth stop and selectively engageable with said housing for blocking rotation of said actuating sleeve relative to said housing.

4,592,258

MANIPULATING DEVICE FOR PERFORMING REMOTELY-CONTROLLED WORK WITH A TOOL

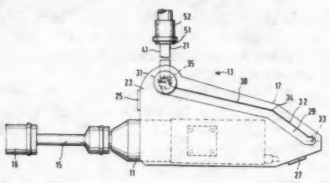
Horst Halm, Dortmund, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,514

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307456

Int. Cl.[4] B25B *29/00*; B23B *47/00*

U.S. Cl. 81—57.4 **5 Claims**



1. A device for performing remotely-controlled work with a power tool such as an impact wrench or the like, the device being supported from support means such as the loading hook of a crane pulley or a power-driven manipulator or the like, the device comprising:

a frame structure including two side plates fixedly mounted to the power tool, said frame structure and said power tool conjointly defining a composite assembly having a common center of gravity;

guide means formed in each of said plates and connecting a first end location to a second end location, said first end location lying in a first reference plane passing through said common center of gravity and said second end location lying in a second reference plane also passing through said common center of gravity and being perpendicular to said first reference plane; and,

a yoke suspended from said support means and slidably and pivotally engaging said guide means so as to permit movement of said yoke between said first end location whereat said composite assembly is suspensively held in midair only at said first end location so as to cause the tool to be in a horizontal operating position and said second end location whereat said composite assembly is suspensively held in midair only at said second end location so as to cause the tool to be in a vertical operating position.

4,592,259

METHOD FOR CONTROLLING THE POSITION OF THE CUTTING EDGES OF LONGITUDINAL WEB CUTTING BLADES AND A LONGITUDINAL CUTTING APPARATUS UTILIZING THE SAME

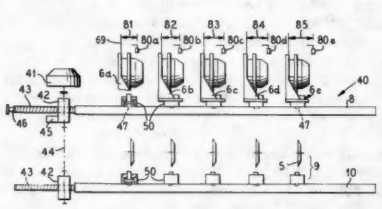
Bernd Görner, Weilheimm/Teck, and Heinz Zeyher, Reichenbach Fils, both of Fed. Rep. of Germany, assignors to Beloit Corporation, Beloit, Wis.

Filed May 8, 1985, Ser. No. 731,775

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417042; May 9, 1984, 8414042

Int. Cl.[4] B26D *1/24*

U.S. Cl. 83—13 **10 Claims**



1. In a method of positioning cutting edges of a pair of circular cutting blades of a longitudinal cutting device for webs of paper and the like, said cutting device having a frame with a pair of rails on each side of the web extending transverse to the direction of movement of the web, each of the pair of blades being mounted in a carriage releasably secured to the rails and transport means for moving the carriages along the rails to obtain the desired position from a bench mark on the frame of the device, the method including shifting each of the carriages for the blades a predetermined distance from the bench mark to obtain a fixed position of the coacting cutting edges from the bench mark and then locking the carriages in said position, the improvements comprising measuring the distance of the cutting edge of one blade from a bench mark of its carriage and using this distance to modify the predetermined distance of movement for the carriage to compensate for variations in the width of the one blade.

4,592,260

BAND CUTTING MACHINE

Ferdinand Gabathuler, Grabs, and Erik G. Nilsson, Werdenberg, both of Switzerland, assignors to Swegea Maschinen AG, Buchs, Switzerland

Filed Mar. 28, 1985, Ser. No. 717,061

Int. Cl.[4] B26D *1/24*

U.S. Cl. 83—74 **10 Claims**

1. A band cutting machine for cutting a tubular article such

to produce at least one band therefrom, said band cutting machine including

a frame;

a rotating cutting means supported by said frame and having at least one rotating cutting member intended to cut such tubular article into at least one band and having further a driving means operative to rotate said cutting member;

a rotatably mounted supporting turntable intended to support a supply of a folded or rolled tubular article to be cut;

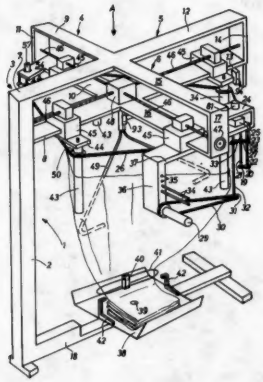
a drive motor coupled to said supporting turntable and operative to rotate said turntable at a controlled rotational speed;

an article feeding and rotating means operative to continuously feed said tubular article towards said cutting means in a spread out condition by drawing said article off said turntable and simultaneously inducing a horizontal rotary movement of said tubular article whereby said tubular article is fed continuously towards said cutting means;

said cutting means comprising

at least one cutting member supporting shaft supported for rotation around its center axis and for a simultaneous controlled translatory longitudinal movement in direction of its center axis relative to at least one section of said frame;

comprising further a control means for controlling the translatory position of said cutting member supporting shaft;



a feeler means operative to scan the position of the upper edge of said rotating tubular article being fed towards said at least one rotating cutting member and to transmit a control signal indicative of the position of said upper edge of the tubular article to said cutting member supporting shaft position control means;

whereby the translatory position of said at least one cutting member relative to said at least one section of the frame is continuously adjusted in accordance with the scanned position of said upper edge of said tubular article such to maintain a continuously and accurately determined width of a respective band being cut;

said rotating article supporting turntable comprising

a tubular article position feeler means mounted thereupon and operative to determine the angular position of the article being rotatively drawn off said turntable relative to the angular position of said turntable and to transmit a control signal indicative of said relative angular position;

whereby upon a first relative angular position of said tubular article being drawn off said turntable relative to said turntable in a first sense of rotation exceeding a first preset value and thus indicative of said rotating tubular article leading said turntable, the rotational speed of said turntable relative to the rotational speed of the rotary movement of said tubular article is increased and upon a second relative angular position of said tubular article relative to said turntable in a second, opposite sense of rotation exceeding a second preset value and thus indicative of said rotating tubular article trailing said turntable, the rotational speed of said turntable relative to the speed of the rotary movement of said tubular article is decreased.

4,592,261

CUTTING DEVICE FOR EXTRA FRINGE OF LAMINATED GLASS INTERLAYER

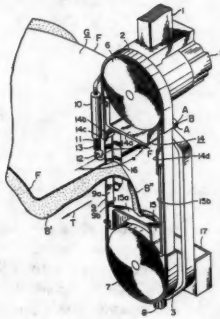
Kiyoshi Miyaji, Matsusaka; Katutoshi Moriyama, Inazawa, and Yoshifumi Oka, Suzuka, all of Japan, assignors to Central Glass Company, Limited, Ube; Toray Engineering Co., Ltd., Osaka and Mitsui & Co., Ltd., Tokyo, all of, Japan

Filed Jul. 20, 1984, Ser. No. 632,849

Claims priority, application Japan, Aug. 2, 1983, 58-140576

Int. Cl.[4] B23D *53/00*

U.S. Cl. 83—102.1 **4 Claims**



1. A cutting device for cutting off extruded extra fringe of an interlayer interposed between sheets of plate glass beyond the area of the sheets of plate glass, the cutting device being arranged to be movable to run along the circumference of the sheets of glass, the cutting device comprising:

a pulley unit including a first pulley, a second pulley, an endless band cutter extending between said first and second pulleys and frame means for carrying said first and second pulleys, said endless band cutter having a front edge and a rear edge with respect to the direction of running of the cutting device;

wherein said pulley unit is arranged such that said first pulley is substantially vertically spaced from said second pulley, and said frame means includes a fixed frame covering said first pulley, a connecting frame integral with said fixed frame, and a movable frame rotatably carrying said second pulley, mounted on said connecting frame, and arranged to be displaceable with respect to said fixed frame;

means mounted on said frame means for driving said endless band cutter in a predetermined rotational direction;

a sliding piece mounted on said frame means and slidably contacting with a rear face of said endless band cutter for removing adherent from said endless band cutter;

a side plate mounted on said frame means and disposed near the rear edge of the endless band cutter, said side plate having a surface forming a predetermined obtuse angle with the adjacent surface portion of the back of said endless band cutter; and

means for guiding the extruded extra fringe of the interlayer which has been cut off by said endless band cutter toward the rear with respect to the direction of running of the cutting device.

4,592,262

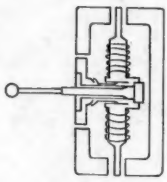
REMOTE CONTROL SYSTEM FOR A MUSICAL INSTRUMENT OR INSTRUMENTS

Tai-Her Yang, P.O. Box 84-85, Taipei, Taiwan

Continuation-in-part of Ser. No. 530,616, Sep. 9, 1983, abandoned, which is a continuation of Ser. No. 344,712, Feb. 1, 1982, abandoned, and a continuation of Ser. No. 561,127, Dec. 13, 1983, abandoned, which is a continuation of Ser. No. 307,520, Sep. 30, 1981, abandoned. This application Jun. 28, 1984, Ser. No. 625,796

Int. Cl.[4] G10F *1/16*; G10G *3/04*

U.S. Cl. 84—115 **16 Claims**



1. A system for producing multi-dimensional sound comprising:

a keyboard including plural selectively-depressable keys K_1–K_n;

sensing means, operatively coupled to said plural keys K_1–K_n, for producing plural signals S_1–S_n indicating parameters of the movements of said plural keys K_1–K_n, respectively;

multiplexing means for multiplexing said plural signals S_1–S_n together to produce a multiplexed signal X;

signal distributing means for producing plural replica signals X_1–X_m of said multiplexed signal X and for selectively adjusting the relative gains of said replica multiplexed signals X_1–X_m independently to produce gain-adjusted replica multiplexed signals Y_1–Y_m;

demultiplexing means, connected to receive said gain-adjusted replica multiplexed signals Y_1–Y_m, for independently demultiplexing each of said gain-adjusted signals Y_1–Y_m to recover plural sets A_{11}–A_{1n}, . . . , A_{mn}–A_{mn} of signals, respectively, said signals A_{11}–A_{m1}, . . . A_{1n}–A_{mn} corresponding to said plural signals S_1–S_n, respectively, as gain-adjusted by said signal distributing means;

first through mth independent discrete remote pianos including sets Z_{11}–Z_{1n}, . . . , Z_{m1}–Z_{mn} of strings, respectively, selectively moveable hammer means H_{11}–H_{1n}, . . . , H_{m1}–H_{mn}, for selectively independently striking said plural strings Z_{11}–Z_{1n}, . . . , Z_{m1}–Z_{mn}, respectively, and further including hammer driving means HD_{11}–HD_{1n}, . . . , HD_{m1}–HD_{mn}, respectively, operatively coupled to said hammer means H_{11}–H_{1n}, . . . H_{m1}–H_{mn}, respectively, for selectively independently mechanically driving said hammer means in response to electrical signals applied thereto; and

means for applying said plural sets A_{11}–A_{1n}, . . . , A_{m1}–A_{mn} demultiplexed signals to corresponding hammer driving means HD_{11}–HD_{1n}, . . . , HD_{m1}–HD_{mn}, respectively, said hammer driving means HD_{11}–HD_{m1}, . . . , HD_{1n}–HD_{mn} driving said hammer means H_{11}–H_{m1}, . . . , H_{1n}–H_{mn}, respectively, in response to parameters of movement of the plural keys K_1–K_n, respectively, and in response to the relative gains of said gain-adjusted multiplexed signals Y_1–Y_m.

4,592,263

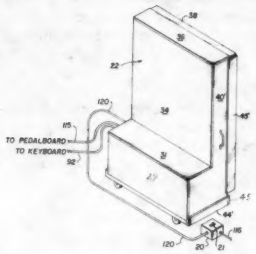
ELECTRO-MECHANICAL STRINGED BASS MACHINE

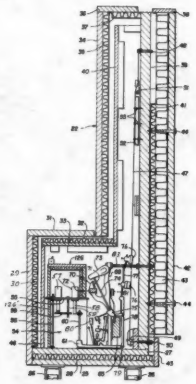
Byron A. Gallimore, Rte. 2, Puryear, Tenn. 38251, and Charles R. Stone, Rte. 1, Benton, Ky. 42025

Filed May 21, 1985, Ser. No. 736,384

Int. Cl.[4] G10D *1/00*; G10C *3/20*

U.S. Cl. 84—173 **10 Claims**





1. A stringed bass machine comprising an acoustically insulated enclosure having an upright portion and a forwardly projecting lower portion, bass guitar strings held in a substantially vertical plane in the upright portion of said enclosure, an upright piano action within said lower portion of the enclosure forwardly of said strings, an electro-mechanical operating means for the piano action within the lower portion of the enclosure forwardly of the piano action and being operatively connected therewith, a remote electrical control unit external to said enclosure and being electrically connected to said electro-mechanical operating means, remote independently operable keyboard and pedalboard units each being adapted for connection with said electro-mechanical operating means, and the keyboard and pedalboard units each having switches one for each key and pedal of the units, whereby a musician operating the machine may utilize the remote keyboard and pedalboard units separately or simultaneously.

4,592,264

VIOLIN FAMILY INSTRUMENTS WITH INTEGRATING TONAL ARM

Daniel Svoboda, 4001 West 30th Ave., Denver, Colo. 80212

Filed May 29, 1984, Ser. No. 614,553

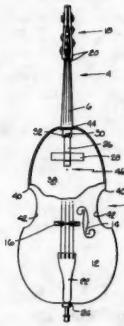
Int. Cl.[4] G10D *1/02*

U.S. Cl. 84—274 **10 Claims**

1. In a stringed musical instrument of the violin type comprising a sound box having an upper chamber and a centroid

associated therewith, a side case, a top plate and a neck with a conventional neck heel inserted into said sound box, an improvement comprising:

an extension of the conventional neck heel connected to the conventional neck heel and extending along the longitudinal extent of the instrument, said neck heel extension having a length less than the longitudinal extent of the instrument; and



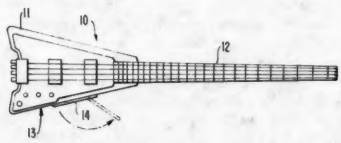
a cross member connected to said neck heel extension with said neck heel extension having a length sufficient to intersect said cross member, said cross member having a longitudinal axis spaced from the centroid and wherein the distance between said longitudinal axis and the centroid is about 17–25% of the distance between the centroid and the end of the upper chamber adjacent to the neck, said neck heel extension and said cross member provided together to reduce overtones in the upper chamber.

4,592,265

FOLDABLE LEG REST FOR STRINGED MUSICAL INSTRUMENT

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Dec. 4, 1984, Ser. No. 678,036
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—327 **3 Claims**



1. A leg rest for a stringed musical instrument, the instrument including a body portion having a substantially planar lower surface when the instrument is oriented in a playing position, the leg rest comprising:

a base member for attachment to said lower surface;

an elongated substantially flat support member;

hinge means for pivotally connecting said support member to said base member; and

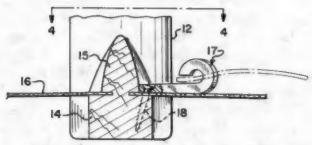
bistable means for alternately biasing said support member into a closed position wherein said support member lies flat against the lower surface of said instrument, and an open position wherein said support member extends downwardly at an angle from said lower surface for resting said instrument on the leg of a seated musician, said leg rest having no substantial protuberance from said lower surface of said instrument when said support member is in said closed position for maintaining a substantially streamlined appearance of said body.

4,592,266

GUITAR STRAP HOOK

Robert W. Daugherty, Dayton, Ohio, assignor to Dayton Band, Inc., Dayton, Ohio

Filed Sep. 13, 1984, Ser. No. 650,039
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—327 **3 Claims**



1. In a guitar comprising a body having a side panel extending between the heel and the foot of a neck mounted thereon, improved strap attachment means comprising:

hook means positioned centrally on said side panel against said heel and provided with a laterally displaced projection for attachably receiving a guitar strap, and

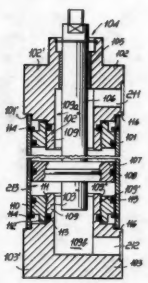
an attachment screw angling downwardly through said hook means and into said foot.

4,592,267

PRESSURIZED FLUID OPERATED CYLINDER

Ferdinando G. Renzi, Padova, Italy, assignor to Fizner Automazione di Renzi Ferdinando G., Padova, Italy

Filed Apr. 2, 1984, Ser. No. 595,890
Claims priority, application Italy, Apr. 15, 1983, 41551 A/83
Int. Cl.[4] F01B *29/00*
U.S. Cl. 92—128 **7 Claims**



1. A pressure fluid operated cylinder comprising a cylinder body having a cylinder bore space therein and a cylindrical inner wall defining said cylinder bore space, a bore axis and a bore diameter, said cylindrical inner wall having an annular edge formation on at least one end thereof, a piston slidable within said bore space and having a piston rod, a cylinder head on each end of said cylinder body and arranged to close said bore, said cylinder heads having fluid passage means in communication with said bore space of the cylinder, at least one of said cylinder heads having a through hole with a diameter for an end portion of said rod and sealing means within said through hole for allowing slidable passage of said rod therethrough in co-axial relationship with said bore, at least one of said cylinder heads having a main body portion with a main

external diameter outside said cylinder wall and a hollow boss-like body portion projecting from said main body portion into said cylinder bore space and coaxial with said cylinder bore axis, said boss-like body portion having an external cylindrical boss surface and an external boss diameter thereof smaller than said main external diameter and smaller than said bore diameter to leave an annular interspace between said inner wall of said cylinder body and said external cylindrical boss surface, said main external diameter being greater than said bore diameter, thereby to define an annular shoulder formation at the location where said boss-like body portion joins said main body portion, said annular shoulder formation abutting against said annular edge of said cylindrical inner wall, a ring within said annular interspace and surrounding said hollow boss-like body, retainer means in said inner wall for preventing axial movement of said ring towards said main body portion beyond said retainer location, and screw thread means connecting said ring with said one cylinder head thereby to allow upon screwing tight said screw thread means said annular shoulder of said one cylinder head to be pressed against said annular edge of said cylindrical inner wall and wherein said screw thread means comprise an outer screw thread on said external cylindrical boss surface and an inner screw thread on said ring in engagement with said outer screw thread and wherein said hollow boss-like body portion has an internal cylindrical cavity with a diameter greater than a diameter of said piston rod and in communication with said bore space and said fluid passage means.

4,592,268

METHOD OF MAKING AND APPARATUS FOR COMPOSITE PISTONS

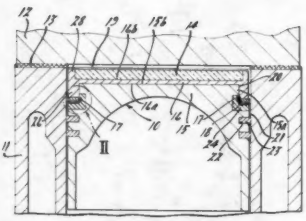
Dale L. Hartsock, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/02035, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983, PCT Pub. No. WO85/02804, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 27, 1983, Ser. No. 617,446

Int. Cl.[4] F16J *1/04*

U.S. Cl. 92—212 **12 Claims**



1. A method of making a composite piston for a reciprocating engine, comprising:

(a) forming members to constitute said composite piston, including:

(i) a piston member comprised of a material selected from plastic and metal having a density of less than about 0.15 lb/in^3, said piston member having a top, a side, and a cast in place metallic ring in the side of the piston member, said ring presenting an annular grooved wall disposed at a location radially opposite a depending portion of the carrier member when the latter is in the wrapped position,

(ii) a ceramic facing member adapted to extend over the top of said piston,

(iii) a carrier member effective to separate said facing member from said piston member while securing said facing member and piston member together for conjoint movement, said carrier member having one side adapted to wrap over the top of the piston with a portion depending along at least a portion of the piston side, said carrier member having an opposite side with means to secure said facing member for movement therewith, said carrier member being comprised of a material having a coefficient of thermal expansion differing from the coefficient of thermal expansion of said ceramic by up to 2.0×10^{-6} in/in/°F., said metallic ring being comprised of a material having a coefficient of thermal expansion intermediate that of the material for the piston member and for the carrier member;

(b) assembling said members by securing said ceramic facing member to said opposite side of the carrier member and wrapping said one side of the carrier member over said piston top with said portion depending along at least a portion of the piston side; and

(c) with the carrier member wrapped about said piston, directing a high energy beam across a zone of said carrier member radially aligned with said grooved wall and effective to melt the portion of the carrier member intersected by said beam, causing said melted material to flow into the groove to fill the same and lock the piston member to the carrier member upon solidification.

4,592,269

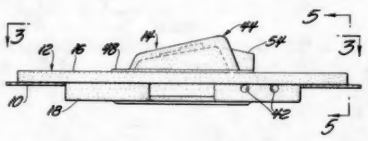
STATIC VENT DEVICE

Ronald C. Lamparter, Grosse Pointe Shores, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Feb. 6, 1985, Ser. No. 698,886

Int. Cl.[4] B60H *1/26*

U.S. Cl. 98—2.14 **11 Claims**



1. A vehicle vent device adapted to permit communication through a vehicle roof panel such that the vehicle passenger compartment is continuously vented to the outside atmosphere in a way to limit the ingress of water through said device, said device comprising:

A. An integral portion **(20)** of said roof panel raised vertically above the panel surface **(16)** to form an air chamber **(32)** which communicates with the vehicle passenger compartment, said integral portion including

(1) a generally planar surface **(30)** vertically spaced above the roof panel surface and sloping downwardly toward the front of the vehicle,

(2) vent opening means **(34–36)** formed through said planar surface and disposed above said panel surface and,

B. a cover member **(44)** enclosing said integral panel portion so as to define a plenum **(46)** therewith, said cover member including an opening **(56)** facing the rear of the vehicle whereby the plenum, vent opening means and the air chamber communicate the inside of the vehicle with the outside atmosphere.

4,592,270

SMOKE AND FIRE PROTECTION SYSTEM FOR ELEVATORS

Alvin S. Vener, 6116 Skyline, Houston, Tex. 77057

Filed Jul. 16, 1984, Ser. No. 631,256

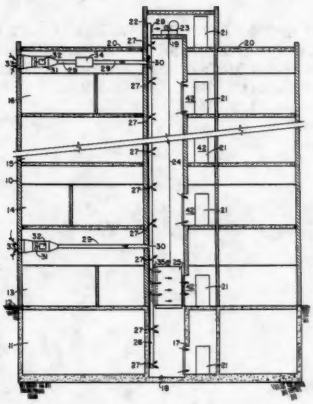
Int. Cl.[4] F24F *11/00*

U.S. Cl. 98—39.1 **15 Claims**

10. A method of protecting an elevator cab in a building, positioned in an elongated elevator hoistway for vertical movement therein, against fire, smoke, or poisonous fumes or gases comprising

introducing fresh air from an intake outside said building

through a duct at high volume and positive pressure into said elevator cab and separately from said duct through a plurality of openings along said duct into said hoistway to ventilate the same and maintain a positive pressure therein



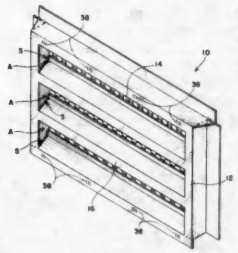
sufficient to effect a continuous outflow of air when the doors are opened to blow fire, smoke, or poison fumes or gases away and to prevent the intrusion of smoke or poison fumes or gases when the doors are closed.

4,592,271

LOUVERED VENT

Lester L. Young, 961 Mitchell Canyon Rd., Clayton, Calif. 94517

Filed Aug. 16, 1985, Ser. No. 766,241
Int. Cl.[4] F24F *13/00*
U.S. Cl. 98—114 **6 Claims**



1. A unitary, louvered, self-flashing vent assembly comprising:

a rear member having a substantially rectangular, planar rear surface, and having opposing top rear and bottom rear portions and opposing side rear portions, wherein said side rear portions and said bottom rear portion are each bent to form an L shaped flange which extends forwardly from said planar rear surface, and wherein said planar rear surface is provided with a plurality of apertures to permit air flow through said rear surface;

a front member having a substantially rectangular, planar front surface having opposing top front and bottom front portions and opposing side front portions, wherein said side front portions and said top front portion are each bent to form an L shaped flange which extends rearwardly from said planar front surface to engage said side rear portions and said bottom rear portion, wherein said front surface is provided with a plurality of louvers extending between said side front portions; and

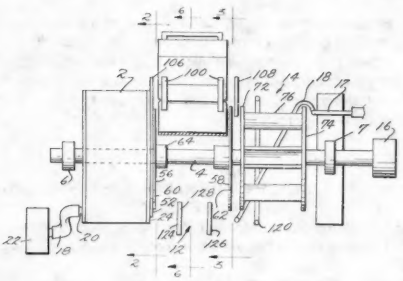
means for attaching said front member to said rear member.

4,592,272

ASSEMBLER FOR ENCHILADA SHELLS

Lorne A. Rowell, Victoria, Canada, assignor to McCormick & Company, Incorporated, Hunt Valley, Md.

Division of Ser. No. 488,984, Apr. 27, 1983, Pat. No. 4,533,559.
This application Aug. 8, 1985, Ser. No. 763,690
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—353 **6 Claims**



1. Apparatus for successively wrapping flattened foodstuff material between sets of inner and outer cooking cylinders comprising:

first means for carrying a series of individual inner cylinders in parallel spaced apart relationship with one another, said inner cylinders having perforated walls,

means for delivering successive individual inner cylinders to said first carrying means,

second means for carrying a series of individual outer cylinders in parallel, spaced apart relationship with one another and in coincidental, end to end relationship with respective individual inner cylinders being carried on said first carrying means,

means for delivering successive individual outer cylinders to said second carrying means,

means for applying a negative pressure differential within said inner cylinders as said inner cylinders is carried along a first path segment by said first carrying means,

means for successively placing an individual said flattened stuff material in said first path segment of said inner cylinders while said inner cylinders is in said first path segment,

guide means for wrappingly urging said placed individual flattened food stuff material against said perforated walls of said individual inner cylinders as said inner cylinders continues along said first path,

means for urging a respective individual said outer cylinders over a respective individual said inner cylinders as said foodstuff material is circumferentially wrapped about said inner cylinders, and

means for successively releasing the resultant assembly from said apparatus.

4,592,273

APPARATUS FOR MAKING BREAD

Masayuki Yonezawa, Kita Kyush, Japan, assignor to Newly Weds Foods, Inc., Chicago, Ill.

Filed Oct. 4, 1984, Ser. No. 657,495
Claims priority, application Japan, Nov. 20, 1983, 57-204934
Int. Cl.[4] A47J *37/00*
U.S. Cl. 99—358 **7 Claims**

1. Apparatus for making bread comprising:

an endless belt conveyor having an insulated bottom belt and

a pair of insulated, opposite side belts, each belt having longitudinally spaced apart, transverse slots therein aligned for receiving edge portions of removable, electrically conductive plates adapted to form opposite sides of a plurality of successive baking compartments for holding bread dough in contact with the plates on opposite sides thereof; and

an electric current source interconnected to contact the conductive plates on opposite sides of each moving compartment for passing an electric current through the dough contained therein to bake the same during movement along the conveyor until plates are removed when baking is completed.

4,592,274

STRETCHING AND MOULDING MACHINE FOR PASTA FILATA CHEESE

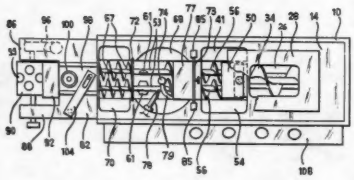
Stefano Tomatis, San Lorenzo di Peveragno, Italy, assignor to CMT Costruzioni Meccaniche e Tecnologie S.p.A., Milan, Italy

Continuation of Ser. No. 606,130, May 2, 1984, abandoned. This application Apr. 23, 1985, Ser. No. 725,164

Claims priority, application Italy, May 3, 1983, 67476 A/83

Int. Cl.[4] B29C *55/00*

U.S. Cl. 99—452 **9 Claims**



1. A stretching and moulding machine for the continuous production of pasta filata cheese, having curd-dicing means to feed diced curds to continuous stretching means for transforming the curds into pasta filata with the addition of hot water and to feed the pasta filata to moulding means, characterized in that the stretching means comprise:

(a) a horizontal, open channel having a closed reception end to receive curds from the curd-dicing means and an opposite, open delivery end to deliver pasta filata continuously to the moulding means;

(b) a substantially cylindrical stretching chamber extending vertically upwards from a middle portion of the channel, having a tunnel communicating with the closed reception end of the channel, and an overflow toward the open delivery end of the channel;

(c) a pair of parallel shafts extending longitudinally in the channel and passing through said tunnel, bearing integral first augers extending from the closed end of the channel to about the middle of the stretching chamber, the parallel shafts being provided with driving means mounted externally to the channel;

(d) a vertical swift rising from the bottom of the channel in the center of the stretching chamber, comprising a shaft bearing radially projecting paddles, the shaft being provided with driving means mounted underneath the channel;

(e) a stationary paddle projecting radially inward from the wall of the stretching chamber, in interlaced relationship with the paddles of the swift; and

(f) water injecting means adapted to inject hot water into the channel.

4,592,275

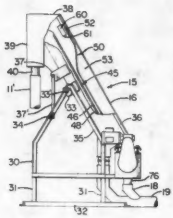
METHOD AND APPARATUS FOR RECOVERY OF USEFUL FEED VALUES FROM ANIMAL WASTE

Gerald P. Frankl, 187 McCook Lake, Jefferson, S. Dak. 57038

Filed Oct. 6, 1983, Ser. No. 539,701

Int. Cl.[4] A01K *1/00;* **A23K** *1/00*

U.S. Cl. 99—495 **12 Claims**



1. In apparatus for separating liquids from solid animal waste material in the recovery of animal feed wherein there is provided an inclined bed having closely spaced slots therein and means for the delivery of a mixture of said liquid and solid animal waste material to an upper portion of said bed for gravitational flow along said upper portion, said slots being spaced for fluidic passage of liquid from said mixture while preventing the passage of solids therethrough, the improvement comprising:

a flexible sheet member overlying said bed including means suspending at least one end of said sheet member in closely spaced relation to said bed toward said upper portion of said bed whereby to form an entrance for gravitational flow of said mixture downwardly between said sheet member and said bed; and

conveyor means for receiving said solids waste material from the lower portion of said bed.

4,592,276

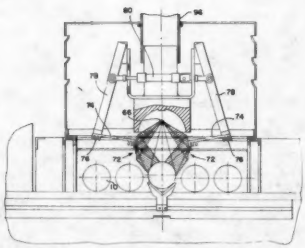
PRINTING MACHINE WITH CURING SYSTEM

Jean Louis M. Dubuit, 63 Rue Du Chemin vert, Paris, France (75011)

Filed Aug. 21, 1985, Ser. No. 767,806

Int. Cl.[4] B41F *17/22*

U.S. Cl. 101—38 A **12 Claims**



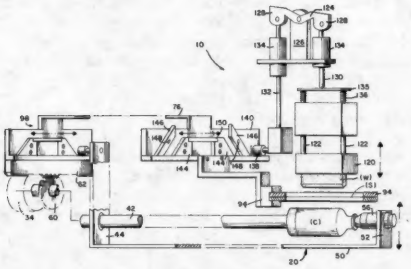
1. In a mechanically controlled printing machine including a conveyor equipped with a plurality of spaced-apart article carriers for moving articles to be printed to a printing station and then to a discharge station, and intermittently operating

drive means for the conveyor whereby the respective article carriers are stopped at the printing station to permit conduct of the printing operation, and wherein ultraviolet reactive ink is used during printing with an ultraviolet curing station being provided for curing of the ink, the improvement in said curing station comprising pick-up means for picking up a printed article, said pick-up means being rotatable about its axis whereby the article is adapted to be rotated during exposure at the curing station, article drive means for rotating said pick-up means about its axis, said article drive means being non-uniform, said article drive means being operatively connected to said intermittently operated drive means whereby the driving action imparted to said pick-up means is simultaneously influenced by said intermittently operated drive means and by said non-uniform drive.

4,592,277
DRIVE FOR STENCILLING APPARATUS

Joseph C. Dennesen, 62 Bridge St., Beverly, Mass. 01915, and Richard S. Wilson, 7 Superior St., Swampscott, Mass. 01907

Filed Jan. 9, 1985, Ser. No. 690,111
Int. Cl.[4] B41F *17/22*
U.S. Cl. 101—38 R **8 Claims**



1. A stencilling apparatus for wiping a pattern of paint through a screen onto a container, comprising:

a. a frame;

b. a screen support mounted on said frame for lateral back and forth movement;

c. a container fixture mounted on said frame for rotationally supporting a container and for movement toward and away from said screen support,

d. a wiper fixture mounting on said frame and having a wiper for movement toward and away from said screen support,

e. a single drive means for rotating said container and causing said screen support movement, said container fixture movement and said wiper fixture movement in timed sequence for wiping the pattern on the container, and

f. said screen support containing a camming device including a cam, said cam coacting with a cam follower on said wiper fixture to cause movement of said wiper fixture toward and away from said screen support.

4,592,278
PRINTING APPARATUS

Masateru Tokuno, Nishinomiya; Tetsuya Sawada, Kyoto, and Yasuharu Mori, Amagasaki, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Dec. 10, 1984, Ser. No. 680,294
Claims priority, application Japan, Dec. 9, 1983, 58-233292
Int. Cl.[4] B41F *5/04, 13/02*
U.S. Cl. 101—181 **3 Claims**

1. A printing apparatus for printing a running web, comprising:

at least one printing unit having a plate cylinder having a circumference which is greater than the maximum printing length and adapted to carry a plate, and an impression cylinder adapted to press the web against said plate on said plate cylinder, and an ink roll;

a first motor for driving said plate cylinder;

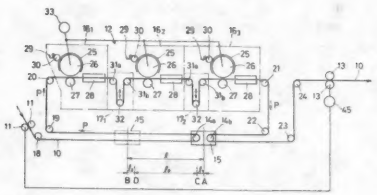
a pair of feed rolls for feeding the web to said printing unit;

a pair of pull rolls for discharging the web out of said printing unit;

a speed adjusting means having a pair of rolls and adapted to be reciprocatable on a straight line for a predetermined distance, the web being guided so as to run between said feed rolls, and around one of said pair of rolls, and through said printing unit, and around the other of said pair of rolls, and between said pull rolls;

a second motor for driving said speed adjusting means;

a third motor for driving said feed rolls and said pull rolls;



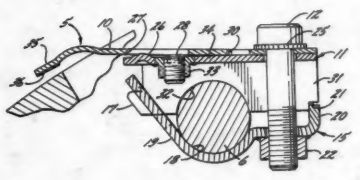
a first electrical control means for controlling the speed of said second motor in relation to the speed of said first motor so that said speed adjusting means will be driven so as to move at a speed equal to half the peripheral speed of said plate cylinder while the web is being printed, and so as to go and come back for said predetermined distance while said plate cylinder makes a full turn; and

a second electrical control means for controlling the speed of said third motor in relation to the speed of said second motor so that said feed rolls and said pull rolls will be driven so as to stop while the web is being printed, and so as to feed and discharge the web to and from said printing unit for a length equal to one printing length while the web is not being printed.

4,592,279
SHEET GRIPPER FOR A PRINTING MACHINE

Klemens Kemmerer, Seligenstadt, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 701,933
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 8404981[U]
Int. Cl.[4] B41F *21/00*
U.S. Cl. 101—412 **5 Claims**



1. A sheet gripper for the delivery system of a printing machine or the like, comprising, in combination, a clamp member adapted to be secured on a pivotable gripper shaft, and a gripper finger mounted resiliently on the clamp member and adapted to be brought into contact with a sheet to be gripped during pivoting of the gripper shaft, said clamp member being made in two sheet-metal parts and includes a base member and a bottom part, which are adapted to be hooked into engage-

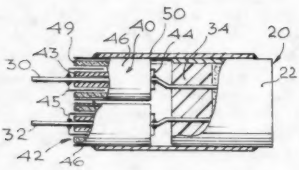
ment with one another on one side of the shaft and connected together by a mounting screw on the other side of the shaft to secure the clamp member on the gripper shaft, the gripper finger also being secured on the base member at one end by means of the mounting screw and being adjustable by means of a set screw threadably received in the base member approximately at the other end thereof, said base member being generally inverted U-shaped having depending side walls formed with substantially semi-circular recess therein for engaging the gripper shaft, said side walls having a pair of projecting ears and said bottom part being formed with a generally concave portion to match the gripper shaft on the other side of the mounting screw and projecting tangentially out of the concave portion and having a pair of recesses adjacent the tangential end to receive said pair of projecting ears on the side walls of the base member thereby affecting engagement with the base member, and said gripper finger being made of spring steel and pre-stressed by means of a transverse rectangular recess of predetermined size between the mounting screw and the set screw.

4,592,280

FILTER/SHIELD FOR ELECTRO-EXPLOSIVE DEVICES

Marvin W. Shores, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 29, 1984, Ser. No. 594,619
Int. Cl.[4] F42B *3/18*
U.S. Cl. 102—202.2 **32 Claims**



1. A squib for use in an electromagnetic environment, comprising:

a cup-shaped casing;

an explosive charge located in the end of said casing;

a bridgewire located in said casing adjacent said explosive charge;

packing for sealing said bridgewire and said explosive charge in said casing;

a first wire connected to one end of said bridgewire and extending through said packing out of said casing at a first location in said packing;

a second wire connected to the other end of said bridgewire and extending through said packing out of said casing at a second location in said packing spaced away from said first wire;

first means for filtering out currents induced in said first wire by said electromagnetic environment, said first filter means connected to said first wire near said first location;

second means for filtering out currents induced in said second wire by said electromagnetic environment, said second filter means connected to said second wire at said second location; and

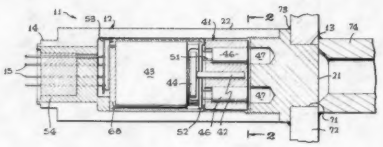
shield means for preventing said electromagnetic environment from causing currents in said bridgewire or the portion of said first and second wires between said bridgewire and said first and second filter means, respectively, said shield means being electrically connected to said casing and said first and second filter means.

4,592,281

ARMING AND FIRING DEVICE

Crosby O. Nagennast, Laverne, Calif., assignor to Special Devices, Inc., Newhall, Calif.

Filed Jul. 29, 1982, Ser. No. 402,913
Int. Cl.[4] F42C *15/40, 15/00*
U.S. Cl. 102—254 **12 Claims**



1. An arming and firing device, comprising:

a body, defining an integral gas-impenetrable plug, having a pyrotechnic or explosive output charge at one end thereof and an internal bulkhead preventing the passage of gasses therethrough;

a shock-producing donor charge packed in intimate contact with the bulkhead and adapted to transmit a shock wave through the bulkhead without rupturing the bulkhead;

a shock-activated receptor charge separated from the donor charge by the bulkhead and adapated to initiate the output charge in response to initiation of the donor charge;

a holder moveable within the body;

a detonator carried by the holder;

arming means including means for moving the holder and thereby selectively positioning the detonator alternatively in or out of firing train with the donor charge; and

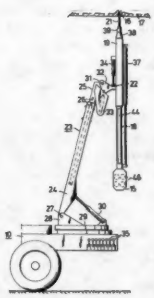
firing means in interruptable communication with the detonator for actuating the detonator on command and thereby initiating the donor charge, said firing means including electrical leads and an isolated shorting pad mounted to the body, and electrical contacts associated with the detonator and adapted to make electrical contact alternatively with the leads or the shorting pad in response to movement of the holder.

4,592,282

CHARGING APPARATUS FOR CARTRIDGED EXPLOSIVES

Ingemar Niemi, Hertiggatan, and Ingvar Hansson, Barriärvägen, both of Sweden, assignors to Luossavaara-Kiirunavaara Aktiebolag, Lulea, Sweden

Filed Jul. 10, 1984, Ser. No. 629,432
Int. Cl.[4] F42B *3/00*
U.S. Cl. 102—313 **6 Claims**



1. A charging apparatus for charging both particulate or liquid explosive and bodies of solid or cartridged explosive,

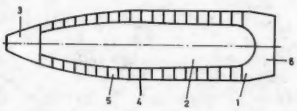
said apparatus comprising: a charging hose, one end part of which is arranged to be connected to at least one supply of particulate or liquid explosive, and the other end part of which is arranged to be inserted into a drill hole, to deliver thereinto explosive advanced from said supply through said charging hose; a guide sleeve for guiding the charging hose; hose feeder means for longitudinal displacement of the charging hose in the guide sleeve; and aligning and adjusting means for carrying the guide sleeve and for locating one end thereof in a charging position for guiding said other end part of the charging hose into the drill hole said guide sleeve including two tubes telescopically positioned one within the other, and an opening in the wall of one of said tubes to permit bodies of solid or cartridged explosive to be inserted into said guide sleeve, and means for displacing said tubes between a first, charging hose guiding position, in which said opening is covered by the other of said tubes, and a second, body-receiving position in which said opening is uncovered to permit lateral insertion of bodies of solid or cartridged explosive therethrough.

4,592,283

EXPLOSIVE SHELL CASE

Lars Hellner; Ingemar Haglund; Torsten Rönn, and Kjell Albrektsson, all of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Sweden

Filed Mar. 21, 1985, Ser. No. 714,284
Claims priority, application Sweden, Apr. 2, 1984, 8401791
Int. Cl.[4] F42B *13/18*
U.S. Cl. 102—493 **10 Claims**



1. An explosive shell case of the type in which fragmentation is accomplished by bursting of the shell material into a plurality of small particles, wherein the shell case comprises a plurality of zones consisting of a completely dense, non-compressible material said zones being separated from each other by a plurality of zones of embrittling material whereby upon detonation the shell bursts into fragments of a predetermined shape.

4,592,284

AUTOMATIC TRANSPORTATION APPARATUS MAKING USE OF UNDERGROUND CABLE

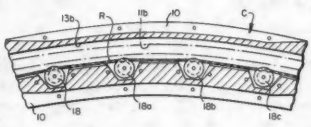
Tomiichi Fukuda, 3-23-18 Denenchofu, Ohta-Ku, Tokyo, Japan

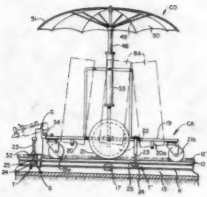
Filed Jul. 11, 1983, Ser. No. 512,764
Int. Cl.[4] B61B *11/00*
U.S. Cl. 104—140 **14 Claims**

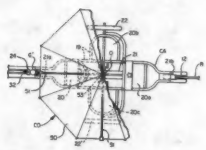
1. An automatic transportation system using a closed cable comprising:

a plurality of U-shaped channel members embedded end-to-end along a ground surface to define a closed elongated longitudinally extending path therealong so that the closed cable is extendable along said path within said plurality of channel members so as to be longitudinally movable therein along said path, said channel members including pulleys mounted therein for rotation about axes perpendicular to the ground surface so as to contact the cable along the lateral sides thereof so as to maintain the cable under tension; and

a cart, said cart including a truck, a grip extending downward from said truck clampable to the cable so that said cart is pulled by the cable when the cable is moved along said path, a main wheel rotatably mounted to said truck centrally thereof for rotatably supporting said cart on said channel members, a guide device mounted to said truck and extendable into said channel members for engaging the interior surface of said channel members to prevent said cart from falling over, means for carrying four golf bags in crosswise relation, and an umbrella-shaped cover removably mounted to said truck so as to cover the golf bags, said cover including a cover sheet and means in said cover sheet, including four radially extending zippers







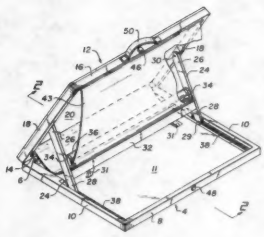
formed in said cover sheet, for uncovering any number of the golf bags while the remaining golf bags are covered, whereby opening any one of said four zippers provides access to one of the golf bags while the cover continues to cover the remaining golf bags.

4,592,285

DRAWING TABLE

Gordon J. Egli, 506 Pendray St., Victoria, British Columbia, Canada (V8V 2A2)

Filed Oct. 4, 1983, Ser. No. 538,963
Int. Cl.[4] A47F *5/12;* A47G *1/24;* G09F *13/04;* F21V *17/02*
U.S. Cl. 108—9 **21 Claims**



1. A drawing table comprising:

(a) a frame having:

(i) a base; and

(ii) a top with a transparent surface and a first end hingedly connected to a first end of the base, so that the

top is pivotable between a closed position adjacent the base, and an open position;

(b) an arm connected to the frame and movable to an unextended position when the top is in the closed position and in which said arm lies substantially parallel to the top and the base, and an extended position when the top is in the open position, and in which said arm extends between positions on the top and base remote from the respective first ends thereof;

(c) retaining means for releasably retaining said arm in the extended position;

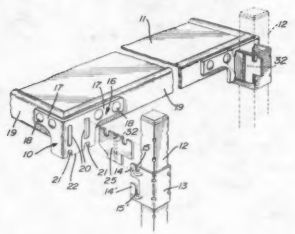
(d) a flexible reflector sheet of flexible sheet material connected to the top at two opposite edges of the transparent surface and suspended between said edges, so that said reflector sheet will be in a stored position within the frame when the top is in the closed position, and can move to an extended position spaced away from and curvedly suspended beneath the top when the top is in the open position.

4,592,286

SHELF CORNER SUPPORT STRUCTURE

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Quebec, Canada

Filed Dec. 15, 1983, Ser. No. 561,530
Int. Cl.[4] A47B *9/00, 47/00;* A47G *29/02*
U.S. Cl. 108—108 **9 Claims**



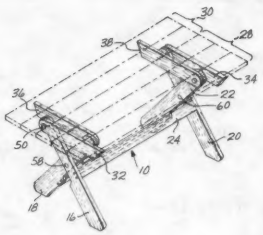
1. A shelf support structure for supporting a rectangular shelf having right-angle corners with right-angle depending vertical side walls, support posts having an adjustably positionable support bracket for supporting said shelf, said bracket having a pair of spaced apart upwardly extending protruding side arms defining respective notches between its associated post and said side arms, said support structure comprising a flat rigid right-angle plate member having two connecting arms disposed at right angles to one another, each said connecting arms having securing means for connection to a respective one of said vertical side walls of each said right-angle corners of said shelf to connect same to a shelf vertical side wall, one of said connecting arms having a pair of vertically extending slotted bores, said pair of side arms of said bracket being receivable in said pair of vertical slotted bores for receiving said plate member seated across said notches forwardly of said post associated therewith and a flat bridge plate for supporting opposed rectangular shelves in planar relationship, said bridge plate having a top edge with a support notch formed adjacent the ends thereof to define opposed support end fingers, said fingers being received in a respective one of said slotted bores of opposed plate members of said opposed shelves, one of said fingers having a lower support edge for abutment with a lower end of an associated slotted bore.

4,592,287

FOLDING TABLE

Lester R. Thygeson, 550 SW. 3rd St., College Place, Wash. 99324

Filed Oct. 31, 1984, Ser. No. 666,812
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—113 **6 Claims**



1. In a folding table of a type having a pair of leg members at each end of the table pivotally connected together at their midportions, for movement between a crossing open position and an in-parallelism, side lapping closed position, and a pair of top parts pivotally connected to the upper ends of the leg members and movable between positions parallel to and outside of the leg members when the table is folded and coplanar positions above the leg members when the table is open, in which they abut each other and lock the leg members in the open position, the improvement of:

said table having an outside leg member and an inside leg member at each end of the table, and wherein such leg members are pivotally connected together such that when the table is folded the lower edge of each leg member is offset inwardly from the upper edge of the other leg member in the region above the pivotal axis and in at least a portion of the region below the pivotal axis; and

said table including a longitudinal brace member interconnected between the two outside leg members at a location below the pivotal axis and at the upper edges of the outside leg members, said longitudinal brace member having inner and outer sides and being positioned such that when the leg members are crossing and the table is open, the brace member is contiguous the inside leg members, and said longitudinal brace member is further positioned such that it lies in a space between the upper edges of the outside leg members and the lower edges of the inside leg members when the table is folded, with its outer side substantially flush with the upper edges of the outside leg members and its inner side substantially contacting the lower edges of the inside leg members, and wherein there is open space between the outside leg members, below the longitudinal brace member, to provide leg space when the table is open.

4,592,288

CYLINDER HEAD BURNER

Donald C. Palmer, Clackamas, Oreg., assignor to U.S. Metal Works, Inc., Sandy, Oreg.

Filed Jan. 28, 1985, Ser. No. 695,689
Int. Cl.[4] F23G *5/12, 5/06*
U.S. Cl. 110—236 **12 Claims**

1. A burner for providing a hot gas stream and directing the stream over an object to be cleaned thereby, comprising:

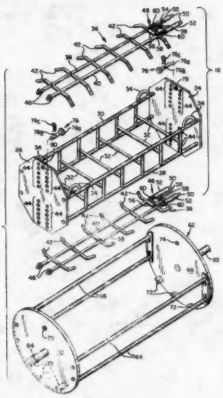
burner means;

a burning chamber having an inlet operably connected to said burner means, a burner pipe connected to said inlet, and an outlet;

a basket for supporting the object within said chamber wherein said basket includes spaced-apart end plates having a plurality of bores therein, fastening means for fasten-

ing the object to be cleaned to said basket including spring-biased means for positioning said fastening means on at least one of said end plates and wherein said fastening means is removably fixable in said bores to accommodate objects of varying size; and

means for removably mounting said basket in said chamber.



4,592,289

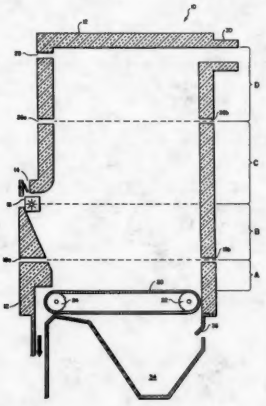
REDUCING POLLUTANT EMISSIONS FROM A SPREADER-STOKER-FIRED FURNACE BY STOICHIOMETRIC CONTROL

David W. Pershing, Salt Lake City, Utah; George B. Martin, Cary, N.C., and James M. Munro, Rapid City, S. Dak., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Oct. 18, 1983, Ser. No. 543,101

Int. Cl.[4] F23J *11/00*

U.S. Cl. 110—345 **6 Claims**



1. A method for reducing pollutant emissions in a spreader-stoker-fired furnace, the method comprising the steps of:

obtaining particles of a combustible material;

introducing the particles of combustible material into a spreader-stoker-fired furnace by a spreading means, the spreader-stoker-fired furnace having a bed region at the bottom thereof, an under-spreader region between the bed region and the spreading means, and an over-spreader region above the spreading means;

combusting the particles of combustible material within the spreader-stoker-fired furnace in the presence of oxygen; and

controlling the amount of oxygen flowing into the spreader-stoker-fired furnace such that the stoichiometric ratio of oxygen to combustible material is within the range of from about 0.6 to about 0.8 in the bed region of the spreader-stoker-fired furnace, is within the range of from about 0.9 to about 1.1 in the under-spreader region of the spreader-fired furnace, and is within the range of from about 0.75 to about 0.95 in the over-spreader region of the spreader-stoker-fired furnace.

4,592,290

METHOD OF INCINERATING STALKS, ESPECIALLY OF STRAW

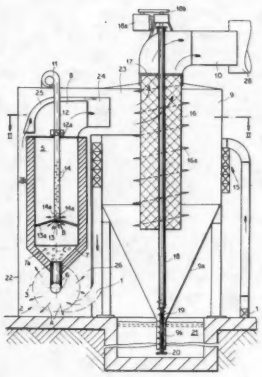
Franz Berthiller, A-3474, Winkl, 22, Austria

Continuation-in-part of Ser. No. 345,382, Feb. 3, 1982, abandoned, which is a division of Ser. No. 163,399, Jun. 26, 1980, Pat. No. 4,314,513. This application May 24, 1985, Ser. No. 738,191

Claims priority, application Austria, Jun. 28, 1979, 4535/79

Int. Cl.[4] F23B *79/00*; **F23G** *5/04*

U.S. Cl. 110—346 **7 Claims**



1. A method of incinerating stalks of a crop material, comprising the steps of:

(a) cutting said stalks of crop material into relatively short pneumatically conveyable pieces;

(b) pneumatically conveying said pieces in an air stream to an incineration station while heating the pneumatically conveyed pieces by causing them to pass in indirect heat exchange with hot combustion gas;

(c) separating the air of said stream from said pieces at said station by trapping the pneumatically conveyed pieces in a screen drum;

(d) compacting the pieces separated from air in said screen drum and feeding said pieces in a compacted body by a worm through a pipe upwardly into an upright combustion chamber so that said compacted body forms a rising plug of said pieces in said combustion chamber so as to sustain a destructive distillation of said pieces below an exposed surface of said body in said chamber to produce a combustible gas;

(e) feeding fresh air to said chamber from a lance reaching downwardly toward said plug to sustain combustion of said combustible gas and burn said pieces at said surface of said body, thereby forming ash at said surface;

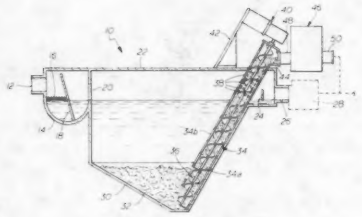
(f) entraining ash upwardly from said surface in a hot gas stream formed by burning said pieces at said surface; and
(g) separating ash from said hot gas stream whereby said hot gas stream can be used for the drying of an agricultural product.

4,592,291

SEWAGE TREATMENT METHOD AND APPARATUS

Dennis W. Sullivan, III, New Iberia, La., assignor to Red Fox Industries, Inc., New Iberia, La.

Filed Mar. 11, 1985, Ser. No. 710,493
Int. Cl.[4] F23G 7/04
U.S. Cl. 110—346 **20 Claims**



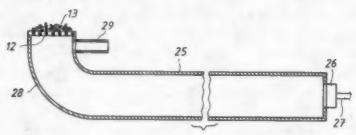
1. A method of treating sewage effluent to reduce total suspended solids content, comprising:
(a) passing the sewage through settling chamber means to cause separation of the sewage into a sewage sludge consisting of water and particulate solids components and a sewage liquid consisting of water and dissolved components;
(b) conveying the sewage sludge through a compression and dewatering step to increase the solids concentration in the sewage sludge;
(c) subjecting the sewage sludge to microwaves guided into the sewage sludge by wave guiding and shielding means from magnetron means wherein the remaining water is removed from the sewage sludge to leave particulates and wherein the particulates are then pyrolized into a particulated ash-like residue; and
(d) mixing the sludge residues into the sewage liquid to form a treated sewage.

4,592,292

METHOD AND APPARATUS FOR ACTIVATING LARGE PARTICLES

Mats Olsson, Bromma, and Roland Sandström, Skellefteå, both of Sweden, assignors to ASEA Stal AB, Västerås, Sweden

Filed Nov. 30, 1984, Ser. No. 677,528
Int. Cl.[4] F23D 1/00
U.S. Cl. 110—347 **16 Claims**



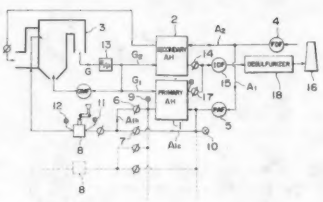
1. A method for the combustion of large particles of solid fuel in a fuel bed located on a grate having certain dimensions in a plane extending therethrough, said method comprising the steps of (1) feeding combustion air toward said fuel bed so as to enable the large particles of solid fuel therein to combust and produce combustion gas, (2) generating high particle velocity sound having a maximum frequency of 60 Hz and a wavelength which is greater than twice said certain dimensions of said grate, and (3) directing said generated sound into the vicinity of said grate to provide a reciprocating movement of said combustion air and combustion gas through said fuel bed thereon, the reciprocating movement occurring in a direction perpendicular to said plane extending through said grate.

4,592,293

METHOD OF CONTROLLING AN AIR HEATER OF A COAL-FIRED BOILER

Eiji Toyama, Hitachi, and Akira Sugano, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,799
Claims priority, application Japan, Nov. 14, 1983, 58-213852
Int. Cl.[4] F23D 1/00
U.S. Cl. 110—347 **8 Claims**



6. A method of controlling an air heater of a coal-fired boiler system comprising an air heater for heating a primary air used to dry a coal and convey it into a boiler of the coal-fired boiler and a secondary air used to combust said coal by a heat exchange between said primary and secondary air and the exhaust gas discharged from said boiler, said air heater including a primary air heater and a secondary air heater arranged in parallel into which the exhaust gas is introduced from said boiler by an induced draft fan, the flow rate of said exhaust gas introduced into each of said air heaters being controlled by a respective gas damper, and said heated primary air being mixed with a cold air to obtain a suitable air temperature to dry and convey said coal, controlling the opening of the damper for introducing said cold air is kept at a low value of approximate 0%, thereby said suitable temperature being obtained by controlling said gas damper for said primary air heater.

4,592,294

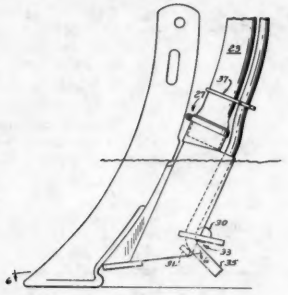
KNIFE APPLICATOR FOR DRY AND LIQUID FERTILIZER

William J. Dietrich, Sr., Congerville; Dean A. Knobloch, Goodfield, and Cary L. Sizelove, Sr., Eureka, all of Ill., assignors to DMI, Inc., Goodfield, Ill.

Filed Mar. 28, 1985, Ser. No. 716,832
Int. Cl.[4] A01C 23/02
U.S. Cl. 111—7 **5 Claims**

1. A fertilizer applicator for agricultural use comprising: a knife for forming a slot in soil; a dry fertilizer conduit in the form of a channel having an upper inlet opening for receiving dry fertilizer and a lower first discharge opening for depositing fertilizer adjacent the bottom of a slot formed by said knife and defining an open slot extending along substantially the entire rear portion thereof; mounting means for mounting said dry fertilizer conduit directly behind said knife and adjacent the lower portion thereof; and a second fertilizer conduit received in said rear slot of said first conduit and engaging the inner

surfaces thereof, the lower portion of said second fertilizer conduit comprising a second discharge opening for depositing



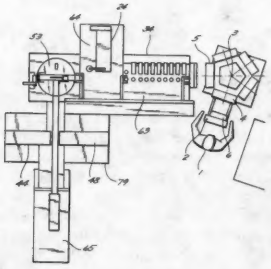
a second fertilizer onto fertilizer already deposited in said slot through said first discharge aperture.

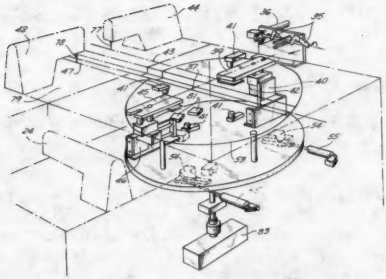
4,592,295

AUTOMATIC SHIRT CUFF MANUFACTURING UNIT

Bernard Cordier, Paris, France, assignor to Fives-Cail Babcock, Paris, France

Filed May 21, 1984, Ser. No. 612,354
Claims priority, application France, May 25, 1983, 83 08602
Int. Cl.[4] D05B *3/04*
U.S. Cl. 112—65 **26 Claims**





1. An automatic shirt cuff manufacturing unit including an overcast stitching machine, a buttonhole forming machine and a button sewing machine for sewing the button on the cuff, said manufacturing unit comprising:

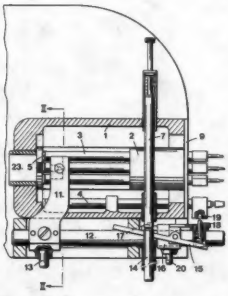
means for conveying the cuff to the overcast stitching machine; means for removing the cuff from the overcast stitching machine; means for positioning at least one of the ends of the cuff with respect to at least one of the working heads of the buttonhole forming and button sewing machines, said working heads being arranged facing one another; means for orienting the cuff so that it arrives with the proper orientation or an orientation at 180° to the same under said working heads; means for conveying the cuff under said working heads and holding it in the correct position; and means for removing the cuff from the buttonhole forming and button sewing machines.

4,592,296

SEWING HEAD

Marcel Fresard, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

PCT No. PCT/CH83/00019, § 371 Date Aug. 2, 1983, § 102(e) Date Aug. 2, 1983, PCT Pub. No. WO83/02967, PCT Pub. Date Sep. 1, 1983
PCT Filed Feb. 22, 1983, Ser. No. 521,758
Claims priority, application Switzerland, Feb. 22, 1982, 1076/82
Int. Cl.[4] D05C *3/04, 7/04;* D05B *55/16*
U.S. Cl. 112—83 **9 Claims**



1. A sewing head for an embroidery machine comprising

a cradle mounted on said embroidery machine;

a cylindrical sector mounted to rotate about an axis within said cradle;

a plurality of needle holder bars carried by said cylindrical sector with each having its longitudinal axis arranged parallel both to the axis of the cylindrical sector and to one another for movement therealong;

a push rod operatively connected to said sector for rotating said cylindrical sector within said cradle to selectively locate only one of said plurality of needle holder bars in an operating position; and

a drive arm actuated by the mechanisms of said embroidery machine for engaging and reciprocally moving said one needle holder bar when in its selective operative position;

whereby said one needle holder bar member is operatively connected to the mechanism of said embroidery machine.

4,592,297

NEEDLE CENTERING DEVICE AND CUTTER FOR A ZIG-ZAG SEWING MACHINE

Satoru Asano, and Shigeru Abe, both of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 10, 1985, Ser. No. 774,479
Claims priority, application Japan, Sep. 10, 1984, 59-189100
Int. Cl.[4] D05B *65/02, 3/02*
U.S. Cl. 112—443 **5 Claims**

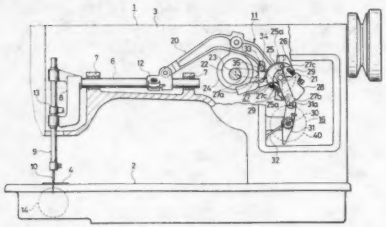
1. A zigzag sewing machine comprising:

a frame including an arm and a bed;

a needle carried by said arm for endwise reciprocation and lateral movement;

oscillating means in said arm for applying said lateral movement to said needle;

a loop taker carried on said bed and forming a seam on a work fabric cooperating with said needle;



thread cutting means carried on said bed; and

shift means for shifting said oscillating means to set the amplitude of said lateral movement in a zero position upon operation of said thread cutting means.

4,592,298

PROPULSION SYSTEM FOR SAILING CRAFTS AND SHIPS

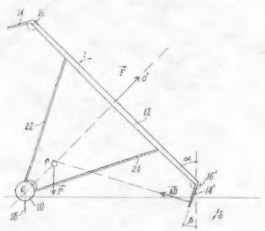
Jean-Marie Finot, Jouy en Josas, France, assignor to Groupe Finot, Jouy en Josas, France

Continuation of Ser. No. 459,040, Jan. 17, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 746,930

Claims priority, application France, Jan. 19, 1982, 82 00743

Int. Cl.[4] B63H *9/04*

U.S. Cl. 114—39 **11 Claims**



1. In a sailing ship of the type including a main shell riding in the water and containing a passenger compartment and a sail mounted on the shell for propelling said shell through the water by the force of wind, during which a torque may be applied to said sail tending to capsize said shell, the improvement of means for balancing said torque and for preventing capsizing of said shell, said means comprising a construction wherein:

said sail comprises an elongated wing having mounted directly on opposite ends thereof generally downwardly extending foils;

and comprising means for mounting said wing in an operative sailing position at a level spaced substantially above said shell such that said wing extends generally transversely of said shell, such that said wing is inclined with said foil at one end thereof dragging in the water at an angle inclined toward said shell from the vertical and such that the entire assembly of said wing, said foils and said mounting means are movable as a unit between oppositely inclined positions with respective said foils dragging in the water, said mounting means being fixed to said shell such that said shell moves with said assembly between said oppositely inclined positions thereof;

said ship having a center of gravity at a location between said shell and said wing;

means for adjusting said angle of inclination of the respective said foil in the water and thereby for controlling the degree of lift and immersion thereof; and

the inclination of said wing and said angle of inclination of said respective foil in the water being such that the force of the wind acting on said wing and creating said torque is balanced by the weight (P) of said ship and by the counterforce (AD) of the water acting on said respective foil in a direction transverse thereto, with said forces (F) and (AD) converging adjacent said center of gravity.

4,592,299

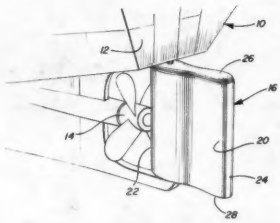
SHIP'S-VESSEL'S RUDDER WITH REDUCED DRAG EFFECTED FACTORS

Joseph R. Christiansen, 1214 Harrisway, Galveston, Tex. 77550

Filed Nov. 7, 1984, Ser. No. 670,216

Int. Cl.[4] B63H *25/38*

U.S. Cl. 114—162 **13 Claims**



9. A laminar flow ship's rudder for disposition closely behind and in horizontal registry with a ship's propeller, said rudder including an upstanding panel-like body including top, bottom and front-and-rear margins and opposite side surfaces extending between said margins, said opposite side surfaces being generally vertically straight and parallel, said front-and-rear margins each being transversely convexly rounded, the opposite side portions of said front margin smoothly merging rearwardly into first laterally outwardly convex forward opposite side surfaces which in turn smoothly merge rearwardly into second laterally outwardly concave mid-length opposite side surfaces smoothly merging rearwardly into third laterally outwardly convex rear opposite side surface which in turn smoothly merge rearwardly into the opposite side poritions of said rounded rear margin of said body.

4,592,300

ANCHOR

Harley E. Swarbrick, 77 Smyth Road, Nedlands, Western Australia, Australia (6009)

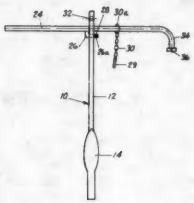
Filed Aug. 13, 1984, Ser. No. 640,096

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—302 **7 Claims**

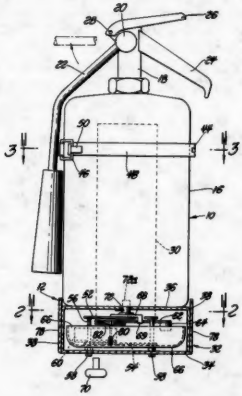
1. An anchor comprising a shank portion, a fluke portion, a stock portion extending through a first aperture in the shank portion and extending laterally of the shank portion when in use, but being demountable so as to be removable from the first aperture in the shank portion entirely and so as to be movable in the first aperture to a position where it can be oriented substantially in alignment with the shank portion, wherein the shank portion contains a second aperture which is spaced from the first aperture in the shank portion, the stock portion is fitted with a keeper comprising an inner portion attached to and extending away from the stock portion and an outer portion attached to the inner portion, extending parallel to the stock portion and being spaced from the stock portion, the keeper in

the operative position of the stock being engageable with the second aperture in the shank portion and the outer portion of



the keeper being provided with means to enable the keeper to be retained in the second aperture.

4,592,301
FIRE EXTINGUISHER SUPPORT MECHANISM INCORPORATING AN AUDIBLE ALARM
Anthony J. Monte, 47660 Bluebird, Utica, Mich. 48087
Filed May 17, 1984, Ser. No. 611,275
Int. Cl.[4] G08B *13/14*
U.S. Cl. 116—67 R **1 Claim**



1. The combination comprising support mechanism for a portable fire extinguisher that is constructed to include a cylindrical bottle (16) having an end wall; and an alarm mechanism indicating that the extinguisher has been removed from the support mechanism:

said support mechanism comprising a hollow base (32) that includes coaxially a circular bottom wall (34), a cylindrical annular side wall (38), and a circular platform (36) spaced above the bottom wall within the space circumscribed by the side wall, said platform occupying a horizontal plane slightly below the upper edge of the annular side wall; the annular side wall having a diameter only slightly greater than the diameter of the fire extinguisher bottle whereby the bottle can be located in an upright attitude with its end wall resting on the aforementioned platform;

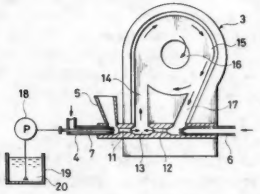
said alarm mechanism being located within the hollow base; said alarm mechanism comprising a cup-shaped gong (66) located above the aforementioned bottom wall in a centered position relative to the annular side wall, and a spring motor (60) within the space circumscribed by the gong, said spring motor having a socket means accessible to a turning key (70) through an opening in the base bottom wall; the key being operable to wind up the spring in the motor to a stressed condition;

said alarm mechanism further including a restraining latch operable to prevent spring motor unwind action; said restraining latch comprising a leaf spring (68) occupying a prone position beneath the aforementioned platform;

said alarm mechanism further including a sensor member (72) projecting upwardly from the leaf spring through an opening in the horizontal platform on the platform axis to contact the end wall of the fire extinguisher bottle whereby the leaf spring is then depressed to a position preventing unwind action of the motor spring; said leaf spring being operable to move to a position permitting unwind action of the motor spring when the extinguisher is removed from the platform;

the aforementioned annular side wall having a multiplicity of openings (78) therearound operable to transmit sound waves gnerated by the aforementioned gong; the diameter of the gong being only slightly less than the diameter of the annular side wall, whereby the alarm mechanism occupies a substantial percentage of the space circumscribed by the side wall.

4,592,302
COATING METHOD AND APPARATUS
Shimesu Motoyama, Asaka; Shizuka Sakashita, Chiba; Nagayoshi Myo, Mitaka; Hirotsune Yasumi, Funabashi, and Hiroaki Ogishima, Tokorozawa, all of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan
Filed Nov. 7, 1984, Ser. No. 669,264
Int. Cl.[4] B05B *7/00*
U.S. Cl. 118—303 **6 Claims**



1. A coating apparatus comprising a pulverization zone provided in a pulverizer, first and second air feed nozzles for sending out jet streams of a high-pressure fluid into said pulverization zones in the directions in which these jet streams collide frontally with each other, a means for feeding a raw material to be pulverized into said pulverization zone with a jet stream from at least one of said air feed nozzles, and a means for feeding a coating material into said pulverization zone consisting of a coating feed nozzle extending coaxially in at least one of said air feed nozzles.

4,592,303
PASTE MATERIAL DISPENSING DEVICE
Leonard P. Wilbur, Jr., Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.
Filed Sep. 26, 1984, Ser. No. 654,486
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—409 **11 Claims**

1. A device for dispensing a paste material onto an edge of an object comprising:

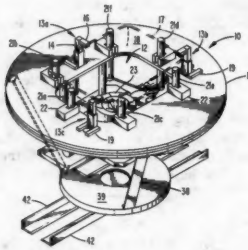
a support plate;

a plurality of reference members supported by said support plate, said reference members defining a reference plane a preselected distance from said support plate, each of said reference members including two angularly disposed arms, one of said arms being pivotably coupled to said

support plate and the other of said arms defining said reference plane when said reference members are in a referencing position;

a plurality of positioning members supported by said support plate, said positioning members being arranged to engage said object to urge said object to a desired location and orientation with respect to said support plate;

centering means for receiving said object at a position substantially centered with respect to said reference members and said positioning members, said centering means being moveable in a direction substantially normal to said reference plane whereby said centering means receives said object and moves said edge into engagement with said reference members to accurately position said edge in said reference plane; and



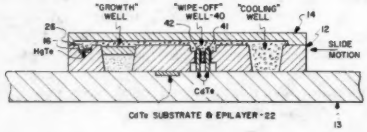
hopper means arranged at a predetermined position with respect to said support plate, for storing and dispensing said paste material onto said edge, said hopper means including a follower for engaging the side of said object in the proximity of said edge whereby said hopper accurately follows said edge and dispenses said paste material onto said edge as said support plate is rotated.

4,592,304

APPARATUS FOR LIQUID PHASE EPITAXY OF MERCURY CADMIUM TELLURIDE

Robert J. Hager, Minneapolis, and R. Andrew Wood, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 18, 1985, Ser. No. 712,836
Int. Cl.[4] H01L *21/208*
U.S. Cl. 118—415 **1 Claim**



1. In a covered graphite slider apparatus for liquid epitaxy growth of mercury cadmium telluride comprising:

a furnace enclosure having therein a graphite furnace boat, the boat further comprising:

a graphite base member having a generally planar top face and having a recess portion in the top face, the recess portion being adapted to receive a semiconductor substrate for epitaxial growth thereon;

an improved graphite slider member having a planar lower face adapted to mate with and to be slideable along said base member top face, said slider member having a first well extending therethrough from a top surface to the lower face for receiving and holding a charge of $(Hg_{1-x}Cd_x)_{1-y}Te_y$, said first well being slideable over said substrate for epitaxial growth of HgCdTe thereon, a second "wipe off" well adjacent to said first well in said slider member and extending through said member to the lower face, which second well has CdTe material loosely placed therein, said CdTe being slideable over the epilayer surface by movement of said slider member following LPE growth to pick up residual growth solution left on the epilayer surfaces, the second "wipe off" well further comprising vertical slots formed in the well, said vertical slots acting as guides for CdTe pieces, said top surface having a depression therein adapted to receive a mercury supplying charge to said wells; and,

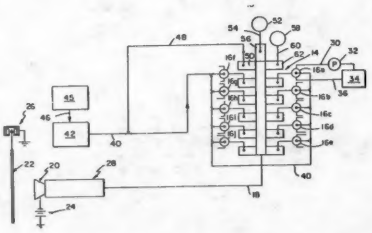
a graphite cover positioned for covering said slider member top surface.

4,592,305

VARIABLE LOW-PRESSURE FLUID COLOR CHANGE CYCLE

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 393,189, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 275,872, Jun. 22, 1981, Pat. No. 4,348,425, which is a continuation-in-part of Ser. No. 228,166, Jan. 26, 1981, Pat. No. 4,311,724. This application Oct. 9, 1985, Ser. No. 786,346
Int. Cl.[4] B05B *12/08, 12/14*
U.S. Cl. 118—677 **42 Claims**



1. In an apparatus for terminating the flow of a coating material in a coating material delivery tube which delivers the coating material to a dispensing device from which the material is dispensed during a coating operation and from which flow of the material ceases at the end of the coating operation, the apparatus including means for terminating the flow of coating material to the delivery tube before the end of the coating operation, and means for initiating the flow of gas at low superatomospheric pressure to the delivery tube to ensure continued delivery of coating material from the delivery tube to the dispensing device during the interval between shut-off of coating material flow to the delivery tube and the end of the coating operation, the improvement comprising means for generating a decreasing magnitude signal, and means for coupling the decreasing magnitude signal generating means to the means for initiating the flow of gas at low atmospheric pressure to the delivery tube to adjust the low superatomospheric pressure to account for the decreasing amount of coating material remaining in the delivery tube between shut-off of coating material flow to the delivery tube and the end of the coating operation.

4,592,306

APPARATUS FOR THE DEPOSITION OF MULTI-LAYER COATINGS

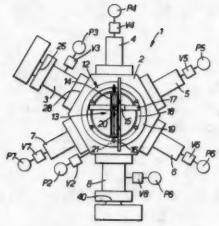
José M. Gallego, Ormskirk, England, assignor to Pilkington Brothers P.L.C., Mersyside, England

Filed Nov. 30, 1984, Ser. No. 676,977

Claims priority, application United Kingdom, Dec. 5, 1983, 8332394

Int. Cl.[4] C23C *14/56, 16/50*

U.S. Cl. 118—719 16 Claims



1. An apparatus for deposition of multi-layer coatings on substrates comprising an evacuable transfer chamber, at least 3 evacuable deposition chambers disposed around the transfer chamber and extending radially away from an axis with the transfer chamber, means for evacuating each of said deposition chambers, and coating means in each of said deposition chambers for depositing a coating layer on a substrate, said evacuable transfer chamber having closable ports providing communication between said transfer chamber and each of said deposition chambers for transfer of a substrate to be coated between said deposition chambers, means for evacuating said transfer chamber, and transfer means rotatably mounted in said transfer chamber for rotation about said axis in the transfer chamber for transferring a substrate between said deposition chambers via the transfer chamber.

4,592,307

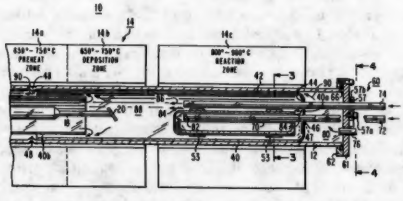
VAPOR PHASE DEPOSITION APPARATUS

Stuart T. Jolly, Yardley, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 706,968

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—719 7 Claims



1. A vapor phase deposition apparatus comprising:

a reactor tube formed of quartz;

a tubular liner formed of pyrolytic boron nitride (PBN) positioned within said reactor tube;

means for positioning a substrate within said liner;

means comprising one or more gas tubes each formed of sapphire for carrying reactant gases through an aperture for each gas tube in a wall of said liner to deposit a layer of material on said substrate;

each of said gas tubes being arranged to be in snug-fit but gas-leak relation through its associated aperture in said wall of said liner establishing thereby a leakage flow path of gas around said gas tube through said aperture; and

means for isolating said liner from said reactor tube by a non-reactive flushing gas passing said flushing gas around said gas tube at said aperture to prevent reactant gases from leaking into or from the interior of said liner through said leakage gas flow path.

4,592,308

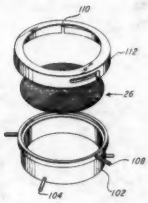
SOLDERLESS MBE SYSTEM

Hung-Dah Shih, Plano, and Tommy J. Bennett, McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 550,654, Nov. 10, 1983, abandoned. This application Aug. 23, 1984, Ser. No. 643,894

Int. Cl.[4] C23C *14/50*

U.S. Cl. 118—726 5 Claims



1. A molecular beam epitaxy system, comprising:

(a) a growth chamber containing a plurality of effusion sources and a substrate support;

(b) means for evacuating said growth chamber to provide an ultrahigh vacuum therein;

(c) a substrate holder and retaining ring, said substrate holder and retaining ring being mutually inflexibly attachable and dimensioned to hold slightly loosely in all directions one or more wafers of predetermined size therebetween, said substrate holder being attachable to a substrate support within said growth chamber; and

(d) means for transferring wafers in and out of said growth chamber

(e) wherein said substrate holder comprises a first set of pins around the circumference thereof, and wherein said substrate support comprises slots positioned to mate with said pins and said substrate holder to retain said substrate holder in contact with said substrate support in a downward facing position.

4,592,309

INTERNAL COMBUSTION ENGINE

Gerald J. Williams, R. R. #2, Nolalu, Ontario, Canada (P0T 2K0)

Continuation-in-part of Ser. No. 268,019, May 28, 1981, Pat. No. 4,493,296. This application Sep. 28, 1984, Ser. No. 655,233

Int. Cl.[4] F02B *75/00, 75/26*

U.S. Cl. 123—39 25 Claims

1. A variable power internal combustion engine comprising

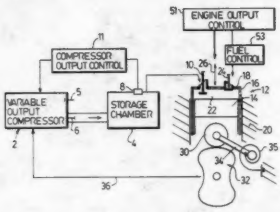
a separate air compressor for receiving and compressing a flow of air to a given pressure, said compressor having an inlet valve introducing a flow of air into said compressor and an outlet valve for exhausting compressed air out of said compressor into a compressed air storage means,

at least one expander having a cylinder, a cylinder head closing an end of said cylinder, a piston reciprocally mounted in said cylinder for movement away from said cylinder head in a power stroke from an initial position defining a combustion chamber within said cylinder between said cylinder head and said piston, to a deep expansion position and for movement in an exhaust stroke

towards said cylinder head returning to said position defining said combustion chamber; an inlet valve for said combustion chamber connecting said compressed air storage means and said combustion chamber for directing a flow of compressed air into said combustion chamber during an intake phase intermediate the start of said power stroke and the completion of said exhaust stroke, an exhaust valve of exhausting an expanded flow of air from said cylinder during said exhaust stroke, and means for adjusting the volume of said combustion chamber;

said compressed air storage means receiving said pressurized flow of air from said compressor and being of a volume adequate to provide compressed air in said combustion chamber essentially at said given pressure essentially over the power output of said engine,

means for introducing an amount of combustible fuel in said compressed charge to be present with compressed air in said combustion chamber and providing combustion of said an amount of fuel in said cylinder with said inlet and exhaust valves closed,



cam shaft means in contact with said piston for absorbing and storing the energy of said power stroke of said piston and controlling movement of the piston within said cylinder during said exhaust stroke and said intake phase to move said piston towards said cylinder head and maintain said piston in said position defining the combustion chamber volume for a time sufficient to complete the flow of compressed air into said cylinder and provide a compressed air pressure within said combustion chamber before combustion essentially equal to the pressure of said storage means and to allow substantial combustion of said compressed air and amount of fuel prior to commencement of said power stroke,

said means for varying the volume of said combustion chamber being controlled in accordance with power requirements to provide variable power output and improved efficiency of said engine at power outputs reduced relative to a given design power output of said engine by providing a variable expansion ratio of a minimum of at least about 30 to 1 at said given design power output and higher with reduced power output.

4,592,310

INTAKE DEVICE FOR INTERNAL COMBUSTION ENGINE

Mitsuo Hitomi; Junzo Sasaki, and Kazuhiko Ueda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

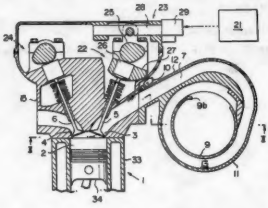
Filed Jan. 22, 1985, Ser. No. 693,299

Claims priority, application Japan, Jan. 26, 1984, 59-12659; Jan. 26, 1984, 59-12660

Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 M **17 Claims**

1. An intake device for an internal combustion engine having an intake passage-length change means which is actuated to shorten the effective length of each intake passage as the engine speed increases so that the engine speed and the frequency of the air-column vibration in the intake passage are tuned with each other to obtain intake inertia effect, wherein the improvement comprises valve timing change means for changing at least the closure timing of each intake valve and control means for controlling the intake passage-length change means and the



valve timing change means in response to each other according to the operating condition of the engine.

4,592,311

INTAKE SYSTEM FOR TWO-CYCLE MULTI-CYLINDER ENGINES

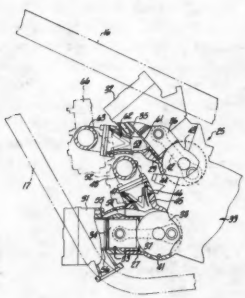
Sakae Makino, Hamakita, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Sep. 25, 1984, Ser. No. 654,650

Claims priority, application Japan, Sep. 26, 1983, 58-177571

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 A **36 Claims**



1. In a two-cycle, crankcase compression engine having a first cylinder reciprocally supporting a first piston, a second cylinder offset from said first cylinder and reciprocally supporting a second piston, a first crankcase associated with said first cylinder, first transfer passage means for transferring a compressed charge from said first crankcase to the area in said first cylinder above said first piston during at least a portion of the stroke of said first piston, a second crankcase associated with said second cylinder and sealed from said first crankcase, second transfer passage means for transferring a compressed charge from said second crankcase to the area in said second cylinder above said second piston during at least a portion of the stroke of said second piston, said first and said second cylinders having facing sides spaced from each other, and an induction system for said crankcases disposed at least in part between said facing sides.

4,592,312

HIGH EFFICIENCY PERFORMANCE KINETIC OCCLUDE SYSTEM WITH ROTARY VALVE

Samuel Hepko, Rte. 1, Box 2170-1, Branson, Mo. 65616

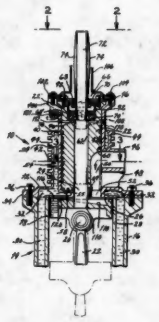
Filed Sep. 12, 1984, Ser. No. 649,699

Int. Cl.[4] F01L *7/00*

U.S. Cl. 123—80 BB **11 Claims**

1. In an internal combustion engine including at least one

cylinder and a piston reciprocal in the cylinder, a rotary valve apparatus for providing high efficiency performance kinetic occlusion of intake and exhaust gases for the cylinder and comprising a valve housing extending above the cylinder, a rotary valve positioned within the housing for rotation about an axis extending in the direction of reciprocation of the piston, at least one passage within the valve for providing communication between at least one port opening into the combustion chamber and exhaust and inlet gas conduits, a shaft carried by and extending above the piston centrally through the valve for reciprocation of the piston, and one-way drive means interconnecting the shaft for rotatably driving the valve in a single direction of rotation about its axis of rotation for providing interconnection by said valve between the combustion chamber and the exhaust and inlet gas conduits, the drive means including structure spirally engaging said shaft for causing an incremental rotation of the valve in said single direction for each stroke of the piston during reciprocation thereof, whereby the valve is incrementally advanced in said single direction during one piston stroke direction and further incrementally advanced in said single direction during an opposite piston stroke direction.



4,592,313

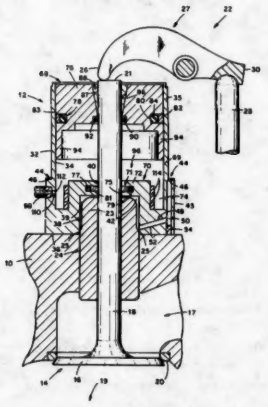
PNEUMATIC VALVE RETURN

Frank H. Speckhart, 513 Dellwood Dr., Knoxville, Tenn. 37917

Filed Oct. 15, 1984, Ser. No. 661,141

Int. Cl.[4] F01L *9/02*

U.S. Cl. 123—90.14 **19 Claims**



1. In a reciprocating piston internal combustion engine having a cylinder head and intake and exhaust valves operated by a cam-driven actuation mechanism, each valve having a valve head for engaging a valve seat in the cylinder head and a valve stem attached to the valve head and extending through and out of the cylinder head to be engaged by the actuation mechanism, the valve stem being supported for reciprocating motion by a valve guide in the cylinder head so that the valve is movable between a closed position with the valve head in contact with the valve seat and an open position with the valve head being spaced-apart from the valve seat and the valve stem being moved inwardly into the cylinder head by the actuation mechanism, the actuation mechanism operating each valve through a cycle in which the valve is in the closed position longer than it is in the open position, a pneumatic valve return comprising:

a valve return body having a cylindrical bore generally centered about the valve stem, said valve return body having a support end supported by said cylinder head and sealingly receiving said valve stem and having an opposing access end having an opening for providing access into said bore to permit the actuation mechanism to engage the valve stem;

a valve return piston slidably and sealably fitted in said cylindrical bore and being sealably attached to and being operable to move with said valve stem, said piston in said bore defining a chamber between said piston and said support end of said return body;

a source of pressurized gas at a selected pressure;

conduit means for introducing said pressurized gas into said chamber;

a restriction in said conduit means of sufficiently small size to prevent the escape of substantial quantities of gas from said chamber into said conduit means when said return piston moves in said bore as said valve stem is moved by the actuation mechanism, said conduit means supplying gas to said chamber through said restriction when the pressure of the gas in said chamber is less than said selected pressure; whereby said pressurized gas in said chamber yieldably exerts a force at all times on said piston to urge the valve to the closed position, the gas in said chamber is replenished when said valve is in the closed position to at least approximately said selected pressure, and said force is increased when the valve is moved toward the open position by the actuation mechanism causing the gas in said chamber to be compressed by said piston.

4,592,314

VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Naoki Tsuchida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

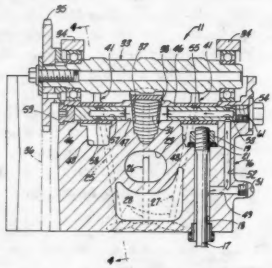
Filed Apr. 18, 1985, Ser. No. 724,603

Int. Cl.[4] F01M *9/10*

U.S. Cl. 123—90.36 **15 Claims**

1. In a valve train for an internal combustion engine having a cylinder head assembly, a first poppet valve supported by said cylinder head assembly for reciprocation along an axis defined by its stem, a second poppet valve supported by said cylinder head assembly for reciprocation along an axis defined by its stem, a camshaft supported by said cylinder head assembly for rotation about a rotational axis intersected by said first poppet valve stem axis, cam means on said camshaft, a tappet slidably supported by said cylinder head assembly and associated with said cam means and said first valve for opening directly said first valve, a rocker arm supported for pivotal movement and associated with said cam means for pivoting said rocker arm, and means on said rocker arm operative to actuate said second valve upon pivotal movement of said rocker arm, the improvement comprising said rocker arm being pivotally supported by a rocker arm shaft carried by said

cylinder head assembly and lubricant passage means extending through said cylinder head assembly and through said rocker



arm shaft for lubricating the pivotal support for said rocker arm and the sliding support for said tappet.

4,592,315

CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

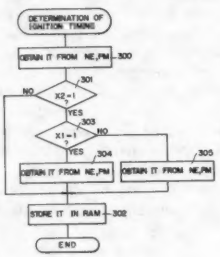
Nobuyuk Kobayashi; Takashi Hattori, and Toshimitsu Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 6, 1985, Ser. No. 730,577

Claims priority, application Japan, May 7, 1984, 59-91591

Int. Cl.[4] F01L *3/00*

U.S. Cl. 123—188 M **16 Claims**



1. A control device of an internal combustion engine, comprising:

an intake passage;

a throttle valve arranged in said intake passage;

switch means operated in response to the degree of opening of said throttle valve and producing an output signal representing a state wherein the degree of opening of said throttle valve is greater than a predetermined degree;

a vacuum sensor arranged in said intake passage and producing an output signal representing the absolute pressure therein;

discriminating means operated in response to the output signals of said switch means and said vacuum sensor for discriminating whether said absolute pressure decreases by a predetermined pressure after the degree of opening of said throttle valve becomes smaller than said predetermined degree to produce an output signal representing a state wherein said absolute pressure decreases by said predetermined pressure after the degree of opening of said throttle valve becomes smaller than said predetermined degree;

a swirl control valve arranged in said intake passage for creating a swirl motion in a combustion chamber when said swirl control valve is closed;

valve control means actuating said swirl control valve in response to the output signals of said switch means and said discriminating means for opening said swirl control valve when the degree of opening of said throttle valve exceeds said predetermined degree and for closing said swirl control valve when said absolute pressure decreases by said predetermined pressure after the degree of opening of said throttle valve becomes smaller than said predetermined degree;

fuel supply means arranged in said intake passage for normally forming a lean air-fuel mixture therein;

fuel supply control means controlling said fuel supply means in response to the output signals of said switch means and said discriminating means for forming a rich air-fuel mixture in said intake passage when the degree of opening of said throttle valve exceeds said predetermined degree and for forming in said intake passage an air-fuel mixture having an intermediate air-fuel ratio between an air-fuel ratio of said lean air-fuel mixture and an air-fuel ratio of said rich air-fuel mixture until the time said absolute pressure decreases by said predetermined pressure after the degree of opening of said throttle valve becomes smaller than said predetermined degree;

a spark plug arranged in said combustion chamber and normally producing a spark at a predetermined basic ignition timing; and,

ignition timing control means controlling the ignition timing of said spark plug in response to the output signals of said switch means and said discriminating means for retarding the ignition timing when the degree of opening of said throttle valve exceeds said predetermined degree and for changing the ignition timing to an intermediate ignition timing between said basic ignition timing and said retarded ignition timing until the time said absolute pressure decreases by said predetermined pressure after the degree of opening of said throttle valve becomes smaller than said predetermined degree.

4,592,316

AIR FUNNEL ASSEMBLY

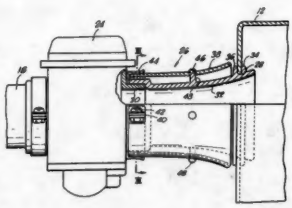
Kouji Shiratsuchi, Saitama, and Hiroshi Nakano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 622,795

Claims priority, application Japan, Jun. 29, 1983, 58-117830; Jun. 29, 1983, 58-117831

Int. Cl.[4] F02M *35/12*

U.S. Cl. 123—195 C **6 Claims**



1. An air funnel assembly between an air inlet and a carburetor, comprising

an elastic air funnel extending between the inlet and the carburetor;

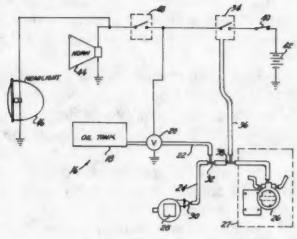
an air funnel cover extending about at least a portion of said elastic air funnel, said air funnel cover being rigid, said elastic air funnel including projections extending outwardly to said air funnel cover and being attached thereto.

4,592,317

MOTOR VEHICLE THEFT DETERRENT DEVICE

Albert A. Wrobel, Wayne, Mich., assignor to Benjamin Brant, West Bloomfield, Mich., a part interest

Filed Mar. 28, 1985, Ser. No. 717,136
Int. Cl.[4] B60R 25/04
U.S. Cl. 123—198 B 16 Claims



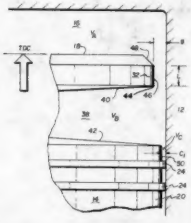
1. A motor vehicle theft deterrent device for a motor vehicle provided with a battery and an internal combustion engine having an inlet and an exhaust, said device comprising a tank containing an oily liquid fluid, a line connecting said tank to the motor vehicle engine intake, a solenoid operated valve in series in said line, a vacuum operated switch for operating said valve, said vacuum operated switch being connected for operation to said engine intake, and a hidden switch in series between said motor vehicle battery and said vacuum operated switch, whereby upon unauthorized operation of said motor vehicle engine with said hidden switch closed said vacuum operated switch opens said valve allowing flow of said oily fluid into said intake for creating smoke in the exhaust of said engine.

4,592,318

INTERNAL COMBUSTION PISTON ENGINE USING AIR CHAMBER IN PISTON DRIVEN IN RESONANCE WITH COMBUSTION WAVE FREQUENCY

Andrew A. Pouring, Edgewater, Md., assignor to Sonex Research Inc., Annapolis, Md.

Filed Sep. 23, 1983, Ser. No. 535,336
Int. Cl.[4] F02B 17/00
U.S. Cl. 123—295 33 Claims



1. In an internal combustion engine including a working chamber having a work producing piston movable therein to cyclically vary the chamber volume to produce at least intake, compression, combustion/expansion and exhaust events in the working chamber, and a charge supply means for delivering a combustible fuel and air charge to the working chamber periodically in timed relationship with the piston movement for combustion reaction and conversion of chemical energy to heat energy in the working chamber to thereby drive the piston to produce work by expansion of gas within the working chamber, said charge supply arranged to establish an axially stratified charge in the working chamber whereby, at least at the beginning of the compression event, only substantially air with a minor amount of fuel insufficient to form a combustible mixture is disposed adjacent the piston within the working chamber; the ignition of each charge producing periodic vibrational shock waves of frequency F_A within the working chamber which travel near the speed of sound C_A within said working chamber at the temperature T_A during combusion in said working chamber; said working chamber comprising a cylindrical bore having a diameter B within which the piston reciprocates; the piston having a guide portion disposed in close-fitting relationship within the bore, a working end portion opposite the guide portion including a working face adjacent the working chamber, the working end portion having a smaller diametrical cross section than said guide portion so as to leave a gap having a transverse dimension or dimensions g between said upper working end portion and the bore; and an intermediate reduced peripheral portion defining an air chamber of fixed volume V_B between said smaller diametrical cross section and the bore, said gap providing the sole communication between the air chamber and the working chamber, the gap having a transverse cross-sectional area S, an axial length L along the bore, a peripheral length along the bore circumference and a volume of S×L; the improvement comprising:

said air chamber and said gap volume being arranged to constitute a Helmholtz resonator having a resonant frequency F_B at the temperature in volume V_B during combustion reaction of the fuel and air charges in the working chamber, with F_B being approximately equal to F_A;

the maximum linear dimensions of said air chamber and gap volume being less than ¼ wavelength of said frequency F_B at the temperature in the air chamber during the combustion/expansion event;

the axial length L of said gap being sufficient to quench flame propagation between the working and air chambers during combustion reaction in the working chamber during all operating conditions of the engine;

the relationship between S, V_B and L being defined as:

$$V_B = \frac{SC^2}{(L + \text{kg})(2\pi F_B)^2} \text{ cm}^3$$

where (using metric units throughout)

C is the speed of sound (cm./sec) in the air chamber at approximately the autoignition temperature of the compressed charge in the working chamber;

k is a Helmholtz correction factor numerically between 0.6 and 0.85;

the minimum dimension of L equals the minimum dimension of g;

g is nominally initially determined by assuming that the gap is uniform along its peripheral length and is related to B in accordance with the formula:

$$g = 0.01072B + 0.1143$$

within the tolerance range of +0.050 cm. and −0.025 cm; and

F_B equals (K/B) Hz, where K has a numerical value between 43,000 and 51,000, and B is the bore diameter; and

the relationship between L, V_B, g and S satisfies the formula:

$$2\pi \sqrt{\frac{(L + \text{kg})^3 V_B}{S^3}} \leqq \text{Approx. 1.0}$$

20. A variable compression ratio internal combustion engine comprising:

(a) a movable piston in a variable volume working chamber in which intake, compression, fuel combustion, expansion and exhaust events occur as the result of piston movement

within the chamber, the piston having a working face defining a movable wall of the working chamber;

(b) an air chamber in the piston adjacent its working face;

(c) said air chamber communicating with the working chamber through a gap having a cross sectional area; and

(d) said gap cross sectional area being dimensioned so that flow of gas into the air chamber from the working chamber is choked during at least part of the compression event during operation of the engine above approximately 65 percent of the maximum operating speed of the engine.

25. A process for carrying out radical enhanced combustion reaction of hydrocarbon fuel in air in a variable volume working chamber of an air breathing internal combustion piston engine wherein intake, compression, combustion/expansion and exhaust events comprise the operating cycle of the engine, comprising:

(a) supplying a fuel and air charge to the working chamber for each operating cycle;

(b) axially stratifying each charge in the working chamber so that substantially only air is adjacent the piston before each compression event;

(c) transferring a portion of the air of the charge with a minor quantity of fuel (i.e., an insufficient quantity of fuel to form a mixture capable of sustained combustion) to a Helmholtz resonating air chamber located in the piston closely adjacent to and in heat exchange relationship with its working face during the compression event, the resonating chamber communicating with the working chamber through a restricted gap orifice located around a circumferential length of the working end of the piston;

(d) initiating combustion reaction of the fuel in the working chamber and carrying out the combustion event at air to fuel ratios limits of approximately 16:1 at best power to approximately 20:1 at best economy;

(e) initiating combustion in the working chamber at a charge temperature in the range of from just below the radical enhanced autoignition temperature of the fuel to just above said temperature by controlling the charge temperature within this range by varying the air to fuel ratio of the incoming charge;

(f) carrying out the combustion with the volume of the air chamber corresponding to:

$$V_B = \frac{SC^2}{(L + \text{kg})(2\pi F_B)^2} \text{ cm}^3$$

where (using metric units throughout):

V_B is the volume of the resonating air chamber;

S is the cross sectional area of the gap orifice;

C is the speed of sound in cm./sec. in the resonating air chamber at approximately the autoignition temperature of the compressed charge in the working chamber;

L is the axial length of the gap;

k is a Helmholtz correction factor numerically between 0.6 and 0.85;

g is the lateral width of the gap, assumed to be uniform over its circumferential length, the gap width being expressed by the formula:

$$g = 0.01072B + 0.1143$$

within the tolerance range of +0.050 cm. and −0.25 cm.; said gap having a maximum actual width not exceeding that width that will produce choked flow between the air and working chambers at least during a fraction of the compression stroke of each compression event;

F_B is a frequency expressed by the formula:

$$F_B = (K/B)\text{Hz}$$

where K is a non-dimensional value between 43,000 and 51,000; and the relationship of L, V_B, g and S satisfies the formula:

$$2\pi \sqrt{\frac{(L + \text{kg})^3 V_B}{S^3}} \leqq \text{Approx. } 1.0$$

(g) transferring heated air from the air chamber to the working chamber throughout the combustion/expansion event by exciting the air chamber at its Helmholtz resonant frequency by combustion shock wave interaction to cause the air to be pumped from the air chamber into the working chamber;

(h) transferring high temperature radicals resulting from combustion to the air chamber during the exhaust event;

(i) seeding the next incoming axially stratified charge with high temperature radicals from the air chamber during the next air intake event;

(j) compressing the radical seeded, axially stratified charge by the piston while transferring a portion of the air with radicals and minor fuel to the air chamber in accordance with step (c) and heating the same in the air chamber by heat transfer with the working end portion of the piston that is at high temperature from the previous combustion-/expansion event up to the initiation of the succeeding combustion event;

(k) carrying out the next succeeding combustion/expansion event with pumping of air and said radicals supplied from the previous combustion event along with new pre-combustion radicals from the air chamber into the working chamber according to step (g) throughout the next succeeding combustion/expansion event; and

(l) cyclically repeating the above steps to produce useful work output of the engine.

4,592,319

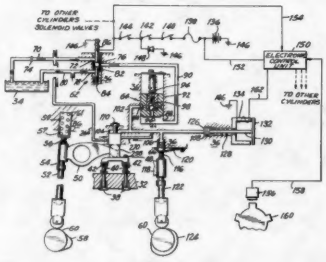
ENGINE RETARDING METHOD AND APPARATUS

Zdenek S. Meistrick, Bloomfield, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Filed Aug. 9, 1985, Ser. No. 763,962

Int. Cl.[4] F02D *13/04*

U.S. Cl. 123—321 **17 Claims**



1. A process for compression release retarding of a cycling multi-cylinder four cycle internal combustion engine having a crankshaft and an engine piston operatively connected to said crankshaft for each cylinder thereof and having intake and exhaust valves for each cylinder thereof comprising, for at least one cylinder thereof, the steps of reducing the flow of fuel to said cylinder, commencing opening the exhaust valve for said cylinder prior to the top dead center position of the said engine piston during an upstroke of the piston corresponding to its compression stroke during normal operation of the engine to produce a compression release event, holding said exhaust valve open during a substantial portion of the ensuing downstroke of said engine piston, disabling said exhaust valve from moving at the point it would move in the cycle during normal operation of the engine, at least partially closing said

exhaust valve commencing near to the bottom dead center position of the said engine piston corresponding to its expansion stroke during normal operation of the engine, holding said exhaust valve in the partially closed position during at least the ensuing upstroke of said engine piston corresponding to its exhaust stroke during normal operation of the engine to produce a bleeder retarding event, operating said intake valve as it would move in the cycle during normal operation of the engine, and fully closing said exhaust valve commencing at least early during the ensuing downstroke of said engine piston corresponding to its intake stroke during normal operation of the engine whereby one compression release retarding event and one bleeder retarding event is produced in said one cylinder during each engine cycle comprising two revolutions of said crankshaft.

10. An engine retarding system of a gas compression release type comprising a multi-cylinder four cycle internal combustion engine having a crankshaft and a camshaft driven in synchronism with said crankshaft, engine piston means associated with said crankshaft, exhaust valve means and intake valve means associated with each cylinder of said engine, pushtube means driven from said camshaft, hydraulic fluid supply means, hydraulically actuated first piston means associated with said exhaust valve means to open said exhaust valve means, second piston means actuated by said first pushtube means and hydraulically interconnected with said first piston means and said hydraulic fluid supply means to open said exhaust valve means during an upstroke of the engine piston associated with said exhaust valve means corresponding to its compression stroke during normal operation of the engine to produce a compression release event, means associated with said pushtube means for holding said exhaust valve open during a substantial portion of the ensuing downstroke of said engine piston, first means responsive to hydraulic pressure supplied by said hydraulic fluid supply means adapted to disable said exhaust valve means from moving at the point it would move in the cycle during normal operation of the engine, third piston means hydraulically interconnecled with said first and second piston means adapted to close at least partially said exhaust valve commencing prior to the bottom dead center position of the said engine piston oorresponding to its expansion stroke during normal operation of the engine and hold said exhaust valve in the partially closed position during at least the ensuing upstroke of said engine piston corresponding to its exhaust stroke during normal operation of the engine to produce a bleeder retarding event, said means associated with said pushtube means further adapted to fully close said exhaust valve commencing at least during the ensuing downstroke of said engine piston corresponding to its intake stroke during normal operation of the engine whereby one compression release retarding event and one bleeder retarding event is produced in such said cylinder during each engine cycle comprising two revolutions of said crankshaft.

4,592,320

METHOD OF AND DEVICE FOR ADAPTIVE FEEDING FORWARD A DISTURBANCE VARIABLE IN A REGULATOR

Cornelius Peter, and Claus Ruppmann, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 26, 1985, Ser. No. 727,901

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424197; Nov. 2, 1984, 3439927

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—339 **12 Claims**

1. A method of forward feeding a disturbance variable in a regulator, particularly in an idling speed air charge regulator for an internal combustion engine, comprising the steps of

storing in a memory an output signal from the regulator occurring at a feed-in time point t_0 of a disturbance;

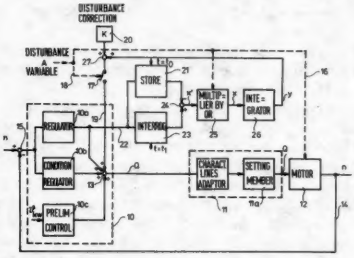
settling the disturbance by the regulator;

comparing at a later time point t_1 when the disturbance has been settled, the actual output signal from the regulator with the stored output signal to produce a difference signal;

deriving from the difference signal an adaptive correction signal; and

combining the adaptive correction signal with a constant disturbance correcting signal K applied to the output of the regulator so as to minimize a deviation between a preset desired magnitude and an actual magnitude under regulation.

7. A device for forward feeding a disturbance variable in a regulator, particularly in an idling speed air charge regulator of an internal combustion engine, comprising a source of a constant disturbance correcting signal, a storing device actuated at a time point t_0 of the occurrence of a disturbance variable and having an input connected to an output of said regulator to store an output signal thereof at the time point t_0, a summing device having an input connected to said source of the constant disturbance correcting signal and an output connected via switching means to a regulating output of said regulator, said switching means being actuated at the time point t_0 of the occurrence of the disturbance variable, comparing means connected to an output of said storing device and to said first mentioned output of the regulator, an output of said comparing means being connected via a preparation circuit to another input of said summing device, and said regulator having an input connected via a subtractor to a regulating feedback path from the engine and to a source of desired value to be regulated.



4,592,321

METHOD AND SYSTEM FOR CONTROL OF IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE

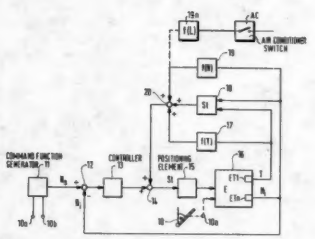
Alfred Schulz, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,819

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311550

Int. Cl.[4] F02D *9/02*

U.S. Cl. 123—339 **12 Claims**



1. A system, for control of idle speed of an internal combustion engine (E), having:

an operating control element (**15**) and an engine controller (**13**) providing an engine control signal, connected to the operating control element of the engine (E) and controlling an operating parameter thereof which affects the operating speed of the engine;

means (**10**, **11**, **10***a*, **10***b*) for generating a speed command signal;

means (ETn, ETt) for generating at least two actual engine operating parameter signals, including an actual speed signal (N_i) and a temperature signal (T);

a comparator (**12**) receiving

(a) the speed command signal (N_s) and

(b) the actual engine speed signal (N_i) and providing a control output signal representative of the difference between commanded and actual speed signals, said control output signal being applied to said controller (**13**) as a controlling signal therefor,

a first (**17**) and a second (**18**) means for producing modifying function signals dependent, respectively, upon engine temperature (T) and actual engine speed (N_i);

a third (**19***n*) means for producing a modifying function signal dependent upon connection of load-producing vehicle components (AC);

signal combining means (**14**) receiving output signals from at least said controller (**13**) and said first, second, and third modifying signal producing means (**17**, **18**, **19***n*) and generating an input signal applied to said engine operating control element (**15**);

the speed command signal generating means (**10**, **11**, **10***a*, **10***b*), the actual speed (N_i) signal generating means (ETn), the comparator (**12**), the controller (**13**), the signal combining means (**14**), the engine control element (**15**) and the engine defining a control loop; wherein,

there is provided a fourth (**19**) modifying function signal producing means, which applies to said signal combining means (**14**) an output signal corresponding to a desired minimum idling speed when actual engine speed (N_i) is no greater than said desired idling speed, and applies a signal which increases as engine speed increases, whenever engine speed is above said idling speed.

4,592,322

APPARATUS FOR THROTTLE VALVE CONTROL

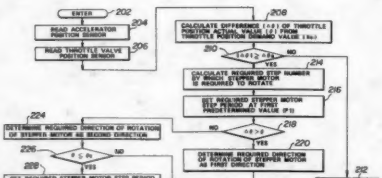
Terukiyo Murakami, Yokosuka; Minoru Tamura, Yokohama, and Hideaki Inoue, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 29, 1985, Ser. No. 738,987

Claims priority, application Japan, May 30, 1984, 59-109815; Jul. 13, 1984, 59-144497; Jul. 13, 1984, 59-144498; Jul. 13, 1984, 59-144499

Int. Cl.[4] F02D *9/00*

U.S. Cl. 123—361 **15 Claims**



1. An apparatus for use with an automotive vehicle having an accelerator pedal and a throttle valve for controlling movement of said throttle valve in response to a change in the position of said accelerator pedal, comprising:

signal sources for generating an electrical signal indicative of the position of said accelerator pedal and an electrical signal indicative of the position of said throttle valve;

a control circuit for calculating a value corresponding to a setting of the position of said throttle valve in response to said accelerator-pedal and throttle-valve position signals;

an actuator connected to said control circuit for moving said throttle valve to said calculated setting; and

said control circuit including means for comparing the throttle valve position with a reference angle, and means for decreasing the speed of closing movement of said throttle valve when the throttle valve position is at an angle equal to or less than said reference angle.

4,592,323

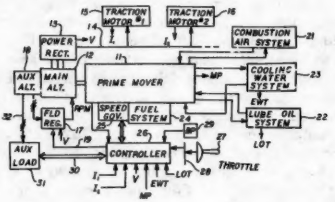
SPEED LIMITING MEANS FOR VARIABLE-SPEED PRIME MOVER

Glenn E. Vest, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Mar. 21, 1985, Ser. No. 714,607

Int. Cl.[4] F02D *41/06;* **F02B** *77/08*

U.S. Cl. 123—362 **15 Claims**



1. In a system comprising a variable-speed prime mover, means including an oil cooler for supplying lubricating oil to the prime mover, throttle means for selecting the operating speed of the prime mover, a controller coupled to the throttle means for providing a speed command signal having a value that normally varies with the selected speed, and speed control means responsive to the command signal for regulating the actual speed of the prime mover, the improvement comprising:

a. means for sensing the temperature of the lubricating oil on the hot oil side of the oil cooler; and

b. maximum speed limiting means associated with the controller and connected to said temperature sensing means for preventing the speed command signal from exceeding a predetermined relatively low value if the sensed oil temperature is below a preset minimum level and for preventing the speed command signal from exceeding another predetermined value which is higher than said predetermined low value if the sensed oil temperature is in a range above said minimum level but not above a predetermined higher level.

4,592,324

IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazumi Nakano, Kariya; Eiji Takakuwa, Okazaki, and Hiroo Utsumi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 9, 1984, Ser. No. 669,878

Claims priority, application Japan, Nov. 16, 1983, 58-215666

Int. Cl.[4] F02P *11/00*

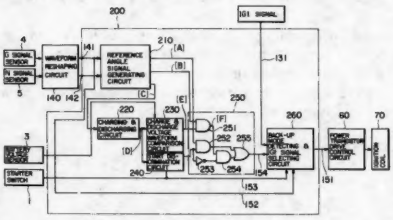
U.S. Cl. 123—424 **8 Claims**

1. An ignition control system for use in an internal combustion engine for controlling the energization starting timing and ignition timing of an ignition coil of said engine by computing control means, said ignition control system comprising:

detecting means for detecting at least one of a failure of said computing control means or in the starting of said engine;

charging and discharging means for converting a rotational speed of said engine to a charged voltage and for discharging said converted charged voltage within a predetermined number of degrees from a predetermined crank angle of said engine so as to form a charge and discharge voltage wave;

charge and discharge voltage waveform comparison means for comparing relative magnitudes of said charge and



discharge voltage wave with a signal indicative of a batter voltage; and

back-up signal generating means responsive to a signal from said charge and discharge waveform voltage comparison means to generate a back-up signal,

whereby said energization starting timing and ignition timing of said ignition coil are controlled in accordance with said back-up signal in response to at least one of said computing control means failure or said engine starting.

4,592,325

AIR/FUEL RATIO CONTROL SYSTEM

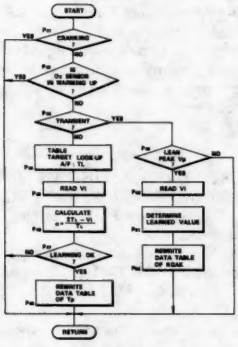
Toyoaki Nakagawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 23, 1985, Ser. No. 726,586

Claims priority, application Japan, Apr. 24, 1984, 59-82494

Int. Cl.[4] F02D *43/00*

U.S. Cl. 123—489 **4 Claims**



1. A system for controlling an air/fuel ratio of a fuel mixture supplied to an internal combustion engine having an exhaust system for passing therethrough exhaust gases resulting from combustion of the fuel mixture within the engine, the control system comprising:

means for detecting an air/fuel ratio of the fuel mixture over a range from a rich range portion to a lean range portion thereof by probing the exhaust gases and generating an actual air/fuel ratio indicative signal;

means for detecting a predetermined transient operating condition of the engine and generating a transient operating condition indicative signal;

means for determining a basic amount of fuel required by the engine and generating a basic amount indicative signal;

means for determining a target value in air/fuel ratio and generating a target air/fuel ratio indicative signal;

means responsive to said actual air/fuel ratio indicative signal and said target air/fuel ratio indicative signal for determining an air/fuel ratio correction coefficient and generating an air/fuel ratio correction coefficient indicative signal;

means for storing values related with transient enrichment coefficient in a data table;

means for retrieving said data table so as to determine a transient enrichment correction coefficient and generating a transient enrichment correction coefficient indicative signal;

means responsive to said transient operating condition indicative signal for rewritting part of said data table; and

means for correcting said basic amount indicative signal with one of said air/fuel ratio correction coefficient indicative signal and said transient enrichment correction coefficient indictive signal selected in response to said transient operating condition indicative signal.

4,592,326

FUEL INJECTION APPARATUS

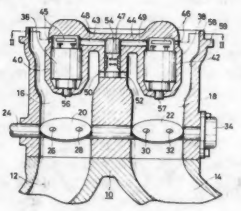
Kimiji Karino, and Yoshiyuki Tanabe, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 638,269

Claims priority, application Japan, Aug. 9, 1983, 58-145851

Int. Cl.[4] F02M *51/00*; G01F *1/68*

U.S. Cl. 123—494 **4 Claims**



1. A fuel injection apparatus comprising:

a plurality of intake tubes each having therein a throttle valve;

a fuel injection valve associated with each of said intake tubes for respectively injecting fuel into each of said intake tubes;

a hot-wire type air flowmeter for measuring a quantity of intake air sucked into said intake tube; and

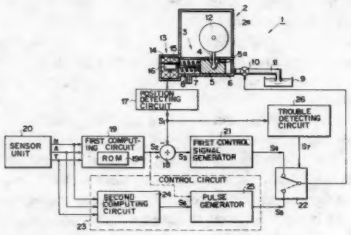
a bypass passage disposed centrally in an upper porton of said plurality of intake tubes for passing a quantity of air which is proportional to the intake air quantity and provided therein with a flow rate detecting portion of said hot-wire type air flow meter, wherein said by-pass passage has an inlet portion for introducing a static pressure of the flow of the intake air sucked into each intake tube, a central portion for introducing the entire quantity of air introduced from each intake tube, and an outlet portion for discharging the air passing through said central portion into each intake tube, and the flow rate detecting portion of said hot-wire type air flow meter is disposed in the central portion of said by-pass passage.

4,592,327

APPARATUS FOR CONTROLLING FUEL INJECTION ADVANCE ANGLE OF A FUEL INJECTION PUMP

Kyoichi Fujimori, and Takeo Ichikawa, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed May 24, 1984, Ser. No. 613,956
Claims priority, application Japan, May 24, 1983, 58-90010
Int. Cl.[4] F02M *59/20*
U.S. Cl. 123—502 **10 Claims**



1. An apparatus for controlling a fuel injection advance angle of a fuel injection pump having a hydraulic type timer with a solenoid valve connected with an injection advance angle adjusting member of said fuel injection pump, said apparatus comprising:

a first means for generating a first signal showing a target injection advance angle for closed-loop control for the condition of operation of an internal combustion engine associated with said fuel injection pump;

a second means for generating a feedback signal related to the actual injection advance angle;

a third means responsive to the first signal and the feedback signal for producing a first control signal for controlling the solenoid valve so as to be in one state of opening or closing when the actual injection advance angle is substantially coincident with the desired target injection advance angle, and to be in the other state of opening or closing when they are not substantially coincident;

means for generating a second signal showing the target injection advance angle for open-loop control according to the condition of operation of the internal combustion engine;

means responsive to the second signal for generating a second control signal, which is a pulse signal having a duty cycle determined in accordance with the second signal, for controlling the average opening of the solenoid valve so as to obtain the optimum injection advance angle;

a detecting means for detecting whether or not the feedback signal is in normal condition; and

a signal changeover means which is responsive to the result detected by said detecting means and supplies the first control signal to the solenoid valve when the feedback signal is in normal condition and supplies the second control signal to the solenoid valve when the feedback signal is not in the normal condition.

4,592,328

CROSSED PULSE ENGINE ATOMIZER

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Continuation-in-part of Ser. No. 425,122, Sep. 27, 1982, Pat. No. 4,508,273. This application Nov. 15, 1984, Ser. No. 671,686
Int. Cl.[4] F02B *15/00*
U.S. Cl. 123—531 **11 Claims**

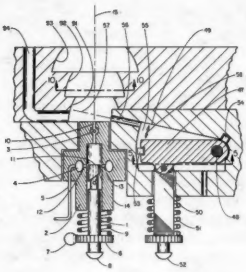
1. An internal combustion engine utilizing liquid fuels comprising:

an internal combustion engine mechanism comprising at least one engine cylinder and each such engine cylinder comprising a combustion chamber;

at least one means for creating more than one liquid pulse and for directing each said liquid pulse to travel along a trajectory, said liquid pulser means comprising; means for controlling the quantity of liquid in each liquid pulse, and means for controlling the number of liquid pulses per engine cycle;

at least one means for creating more than one gas pulse and for directing each said gas pulse to travel along a trajectory whose centerline intersects the centerline of at least one of said liquid pulse trajectories at an angle of approximately ninety degrees, said gas pulser means comprising means for controlling the number of gas pulses per engine cycle;

means for fastening at least one liquid pulser means to each said engine cylinder so that all liquid pulses created by all said liquid pulser means on each said engine cylinder travel along trajectories within said combustion chamber of said engine cylinder;



means for fastening at least one gas pulser means to each said engine cylinder so that all gas pulses created by all said gas pulser means on each said engine cylinder travel along trajectories within said combustion chamber of said engine cylinder;

means for driving and timing said liquid pulser means and said gas pulser means so that, more than one liquid pulse is created for each engine cycle of each engine cylinder when the engine is generating power, all liquid pulses for any one engine cycle are timed to be delivered into the engine cylinder near the end of the compression process for that engine cycle, each of said liquid pulses is impacted while traveling along said liquid pulse trajectory by at least one of said gas pulses while traveling along said gas pulse trajectories.

4,592,329

APPARATUS AND OPERATING METHOD FOR AN INTERNAL COMBUSTION ENGINE

Henry Yunick, Daytona Beach, Fla., assignor to Motortech, Inc., Daytona Beach, Fla.

Division of Ser. No. 312,495, Oct. 19, 1981, abandoned. This application Jun. 21, 1984, Ser. No. 623,053
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—545 **4 Claims**

1. An internal combustion engine comprising:

(a) block structure including at least one reaction chamber and an exhaust gas outlet, the block structure being adapted to be mounted in a vehicle;

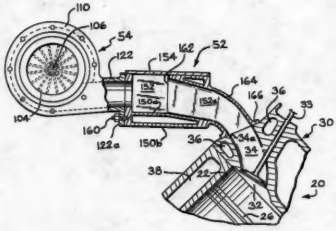
(b) a fuel entrainment mechanism including means for mounting the entrainment mechanism on the vehicle independent of the block structure, the entrainment mechanism being adapted to entrain fuel in a flow of air to produce a fuel/air mixture;

(c) a fuel homogenizer mechanism for homogenizing the fuel/air mixture and being further operative to urge said fuel/air mixture towards said reaction chamber and inhibit reverse flow;

(d) a fuel delivering conduit mechanism connecting the

entrainment mechanism with the homogenizer for conducting fuel from the entrainment mechanism to the homogenizer; the conduit mechanism including a vibration isolator for isolating the entrainment mechanism from vibrations emanating from the block structure;

(e) a plenum mechanism connecting the homogenizer to the block structure for delivering the homogenized mixture from the homogenizer to the block structure;



(f) engine fluid delivery means for delivery of heat from an engine fluid to at least one of said mechanisms to heat the fuel/air mixture prior to its entry to the plenum mechanism; and,

(g) exhaust gas conducting means connecting the block structure to the plenum mechanism for conducting exhaust gases from the block structure to the plenum mechanism to heat the mixture as it flows through the plenum mechanism.

4,592,330

PRESSURE WAVE SUPERCHARGER WITH AN EXHAUST GAS BLOW-DOWN VALVE

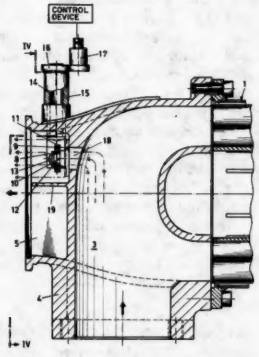
Andreas Mayer, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 21, 1984, Ser. No. 623,239

Claims priority, application Switzerland, Jun. 29, 1983, 3561/83

Int. Cl.⁴ F02B *33/42*

U.S. Cl. 123—559 **3 Claims**



1. In a pressue wave supercharger with an exhaust blow-down valve, which pressure wave supercharger has a rotor casing, a cell rotor in which exhaust gas of an internal combustion engine is utilized to compress combustion air required by an internal combustion engine, an air casing through which the atmospheric air is induced and, after compression in the cell rotor, is supplied as supercharged air to the internal combustion engine, and a gas casing defining an exhaust gas space, by which the exhaust gas coming from the internal combustion engine is led into the cell rotor and, after its expansion in the cell rotor, is led into an exhaust gas outlet stub pipe, which pipe leads into an exhaust gas collector, the exhaust gas blow-down valve being located in a wall of the gas casing separating the exhaust gas space from the exhaust gas outlet stub pipe and being a flap valve having a flap and levered shaft means for connecting said flap to a control device, wherein the improvement comprises a restraining screen in the exhaust gas outlet stub pipe, which restraining screen surrounds at least a part of the periphery of the flap at a distance from said periphery, the restraining screen having a wall extending substantially parallel to the axis of the exhaust gas outlet stub pipe and into the exhaust gas outlet stub pipe.

4,592,331

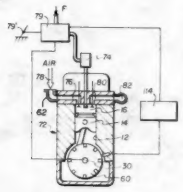
COMBUSTION PROCESS FOR I.C. ENGINE USING A RESONATING AIR CHAMBER IN A RECIPROCATING PISTON TO INDUCE CLOSED ORGAN PIPE RESONANCE IN THE COMBUSTION CHAMBER

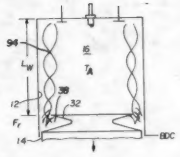
Andrew A. Pouring, Edgewater, Md., assignor to Sonex Research Inc., Annapolis, Md.

Filed Sep. 23, 1983, Ser. No. 535,338

Int. Cl.⁴ F02B *17/00*

U.S. Cl. 123—660 **3 Claims**





1. A process for carrying out a cyclic combustion reaction of fuel and air in a variable volume bore of an internal combustion engine constituting a working chamber in which the fuel is reacted to convert chemical energy into heat energy for producing work by expansion of products of combustion against the working face of a piston reciprocable in the bore, the piston drivingly connected to a work utilization device of the engine, comprising:

(a) providing a Helmholtz resonating chamber in the piston adjacent its working face, the resonating chamber including a restricted orifice in communication with the working chamber and an enlarged volume that is large in comparison with the orifice volume in communication with the orifice, the dimensions of the enlarged volume and orifice being such that the Helmholtz resonating frequency of the resonating chamber corresponds approximately to the frequency of the shock waves generated upon initiation of combustion of the fuel in the working chamber, and all linear dimensions of the orifice and chamber are less than ¼ wavelength of said resonating frequency at the approximate temperature of the resonating chamber during combustion and expansion of the fuel in the working chamber;

(b) separately supplying air and fuel to the working chamber

as a charge and transferring a portion of the air into the resonating chamber during compression of the charge;

(c) igniting and reacting the fuel and air mixture in the working chamber to produce heat and work;

(d) heating the air in the resonating chamber by heat exchange with the products of reaction;

(e) exciting the heated air in said resonating chamber at its Helmholtz resonant frequency during each combustion reaction event in the working chamber by said shock waves to cause periodic pumping of heated air from the resonating chamber into the working chamber throughout the combustion/expansion events; and

(f) inducing closed organ pipe resonance of the gas in the working chamber after each initiation of the combustion reaction in the working chamber by the periodic flow of air from the resonating chamber into the working chamber through said orifice at said Helmholtz resonant frequency, said closed organ pipe resonance being induced at least when the working chamber is at or substantially near maximum volume following the combustion/expansion event.

4,592,332

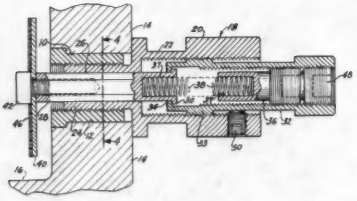
ARROW REST DEVICE

Donald G. Topping, 886 Woodbine Dr., Crestwood, Mo. 63126

Filed Apr. 23, 1984, Ser. No. 602,692

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—41 A **2 Claims**



1. In an archery bow an arrow rest device comprising an elongated cylindrical body having a first smaller diameter portion fixed in and extending from side to side through the handle section of the bow and a second larger diameter portion projecting from one side thereof, said second portion having a relatively large diameter screw threaded axial bore therethrough and said first portion having a smaller non-circular axial bore therethrough, a hollow cylindrical internally and externally screw threaded positional adjustment member threadedly engaged in said larger second portion, said positional adjustment member having a transverse inner end wall with a central perforation therein, a one piece, non circular rod having a circular flange at one end larger than said central perforation passes through said perforation with said end flange abutting said end wall, and with said rod extending through and slidable in said non-circular axial bore in said first body portion, a screw threaded spring adjustment member threadedly engaged in the outer end of said positional adjustment member, a spring biased betwen the inner end of said rod and the inner end of said spring adjustment member for yieldably holding said end flange against said end wall, and an arrow rest support plate having an arrow rest element attached thereto detachably connected to the other end of said rod.

4,592,333

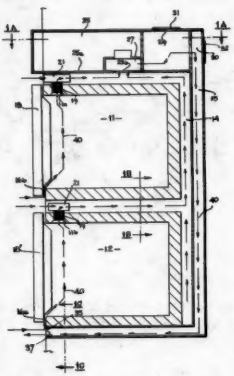
CONVERTIBLE VENTILATION SYSTEM FOR OVEN

Terry C. Dustin, Southgate, Calif., assignor to Masco Building Products Corp., Taylor, Mich.

Filed Jul. 2, 1985, Ser. No. 751,265

Int. Cl.[4] F24C *15/32*

U.S. Cl. 126—21 R **5 Claims**



1. In an oven system having upper and lower oven compartments, the improvement being means for providing a first mode of operation wherein the oven compartments are vented into the indoor ambient atmosphere and a second mode of operation wherein the oven compartments are vented to the outdoor comprising:

a first venting channel running along the upper oven compartment at the rear top and bottom thereof and the lower oven compartment at the top and rear thereof;

a second venting channel running along the rear portion of the first venting channel and the bottom of the lower oven compartment;

means for venting said oven compartments into said first venting channel;

means for venting one end of said second venting channel to the indoor ambient atmosphere, said venting means being located below the lower oven compartment;

means for inducing a flow of air in said venting channels;

means in said first mode of operation for interconnecting said first and second channels and preventing fluid communications to the outdoor, said air flow inducing means effecting an air flow from said oven compartments through said first channel to said second channel and out into the indoor ambient atmosphere through said venting means below the lower oven compartment; and

means in said second mode of operation for preventing fluid communications between said first and second channels and effecting fluid communications between said first venting channel and the outdoors, said air flow inducing means effecting an air flow from said oven compartments through first channel to the outdoors.

4,592,334

CHARCOAL CONCENTRATING IMPLEMENT

Clifford K. Logan, Jr., 7922 Hemingford Ct., Apt. #8, Oklahoma City, Okla. 73120

Filed Nov. 16, 1984, Ser. No. 672,202

Int. Cl.[4] F24B *3/00*; A47J *37/00*

U.S. Cl. 126—25 B **16 Claims**

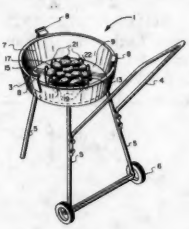
1. An improved charcoal burning grill having a charcoal concentrating implement comprising:

(a) a fire box having a charcoal supporting surface with an upright sidewall completely surrounding the charcoal supporting surface,

(b) restraining means for confining burning charcoal on a portion of said charcoal supporting surface,

(c) said restraining means further comprising a band of generally uniform width having,

a predetermined length, a first end, an intermediate portion with a pattern of openings and a second end along said length, said ends connected by means for connection, the edges of the band form an upper and a lower perimeter spaced apart by the width of the band, said



lower perimeter being in supported contact with the charcoal supporting surface of the firebox, said band width corresponding to the height of a charcoal holding enclosure formed by the band and being less than the height of the sidewall of the firebox, and;

(d) means for supporting food for cooking mounted on said firebox above said enclosure for cooking over a portion of the available charcoal supporting surface without using the remainder of said surface.

4,592,335

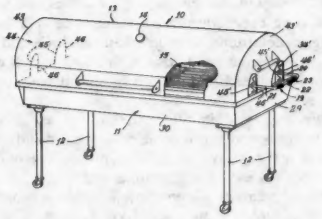
SLANT ADJUSTABLE GRILL

Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc., North Aurora, Ill.

Filed May 17, 1985, Ser. No. 735,479

Int. Cl.[4] A47J *37/00*

U.S. Cl. 126—25 A **8 Claims**



1. A slant adjustable grill assembly for use with an outdoor cooking device of the type having a firebox including opposing end walls, front and rear walls, and a fire bed means for holding charcoal and the like, the slant adjustable grill assembly comprising: a plurality of longitudinal grill members and transverse grill support members, a pair of opposing handle means, said handle means each including front and rear extending arms being affixed to said transverse support members and extending outwardly from the longitudinal support members, said extending arms joined by a transverse handle portion; a pair of grill support panels affixed vertically in parallel relationship at said opposite end walls of the firebox, said grill support panels having first slanted slot means formed at a front edge thereof and capable of receiving the front extending arms of each handle means, the grill support panels further having a second slanted slot means spaced from said first slanted slot means a sufficient distance to accommodate the rear extending arms of each handle means, said second slanted slot means being formed with an adjacent vertical passage for accommodating vertical movement of the rear extending arms therein, said grill support panels being substantially identical wherein the first and second slot means of either panel comprises a corresponding number of vertically spaced slanted slots residing in spaced apart horizontal planes passing through the corresponding slots of both panels, the slots of the first and second slot means at one panel residing in a vertical plane parallel to the slots of the first and second slot means of the other panel, said handle means being selectively engageable at said extending arms with said first and second slanted slot means whereby the grill is fully removable and adjustable to be pivotably opened, placed parallel to the fire bed, or slanted in a left/right or front/back orientation, wherein the front extending arms of each handle means may be engaged at said first slot means of both panels at one horizontal plane while the rear extending arms may be engaged at the second slanted slot means of both panels at a second horizontal plane, and wherein both the front and rear extending arms of one said handle means may both engage the first and second slanted slot means of one panel at one horizontal plane while the front and rear extending arms of the other handle means may engage the first and second slanted slot means of the other panel at a second horizontal plane and wherein the front and rear extending arms of both handle means may be engaged at the first and second slot means of both said panels at the same horizontal plane, wherein said slant adjustable grill may be arranged to have the rear extending arms of both handle means engaged at an uppermost slot of the second slanted slot means at both said grill support panels and said slant adjustable grill thereby being capable of being pivotably opened away from said firebox, and said extending arms being fully disengageable from said first and second slot means, said grill assembly further including a lid capable of being opened and closed over the firebox and grill, said lid including opposing access cut-out means therethrough arranged whereby to accommodate the extending arms of said handle means therein and expose said slanted slot means of the grill support panels when the lid is closed, whereby said grill may be adjusted at said grill support panels to be parallel to said fire bed, sloped forwardly or backwardly, sloped downwardly to the left or right, while the lid remains closed over the fire box.

4,592,336

CHIMNEY COUPLING FOR A FLUE GAS PIPE

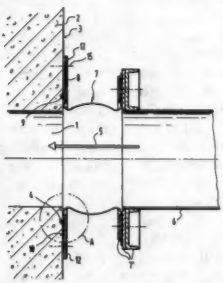
Peter Bendl, Wolfratshausen, Fed. Rep. of Germany, assignor to Feodor Burgmann Dichtungswerke GmbH & Co., Wolfratshausen, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,699

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1984, 3440375

Int. Cl.[4] F23J *13/00*

U.S. Cl. 126—314 **13 Claims**



1. In a coupling assembly connecting a flue gas pipe with an inlet duct of a chimney, said coupling assembly including a

tubular compensator having a first end secured to said flue gas pipe and a second end oriented towards said inlet duct; said second end having a radially projecting flange having a frontal face oriented towards said inlet duct and a reverse face oriented towards said flue gas pipe; and clamping means for engaging said reverse face of said flange for pressing said frontal face hermetically against said chimney; the improvement comprising

(a) a planar face forming part of said chimney and surrounding said inlet duct;

(b) a groove provided in said planar face and spacedly surrounding said inlet duct; said groove having a cross-sectional shape;

(c) an endless bead forming part of said flange and projecting from said frontal face thereof; said bead being received in said groove; said bead having a cross-sectional shape being essentially complemental to the cross-sectional shape of said groove;

(d) screw connections anchored in said chimney externally of said flange of said compensator;

(e) pressing members operatively connected to said screw connections and being pressed thereby against said reverse face of said flange; said pressing members extending over and across said bead; said screw connections and said pressing members forming part of said clamping means; and

(f) a rubber-elastic adhesive layer situated between said frontal face of said flange and said planar face and being glued to said frontal face, said bead, said planar face and said groove.

4,592,337

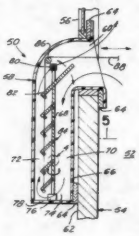
THERMO BAG

Martin T. Ritchie, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Aug. 12, 1985, Ser. No. 764,730

Int. Cl.[4] F24J *2/38*

U.S. Cl. 126—424 **1 Claim**



1. A thermo bag for heating air within a room in a building through a window with solar radiation, the bag comprising:

(a) a transparent housing having an open back adapted to be mounted within said window and extend downwardly on exterior wall of said building;

(b) VELCRO mating strips attached around said open back and a rear portion of said housing so that said open back can be secured to said window and said rear portion can be secured to said exterior wall;

(c) an air flow divider located within said housing to vertically divide said housing into a back chamber and a front chamber with a bottom spaced opening therebetween, said divider pivotally mounted on the bottom of said housing so that said divider can be vertically adjusted to the solar radiation;

(d) a plurality of heat-storing collector plates, each said plate pivotally attached to said divider and spring biased so that said plate will normally extend forwardly therefrom at a generally angular projection to catch said solar radiation;

(e) a roller mounted to said housing above said collector plates; and

(f) a cord attached to the front of each said collector plate, around said roller and out of said open back and tied to a fixed structure within said room so that when said cord is pulled said angular projection of said collector plates will change for proper adjustment to the sun's rays, thus cool air from said room will enter said back chamber through to said front chamber to be heated by said collectors plates and exit as warm air through said open back into said room.

4,592,338

CALF SCREENING

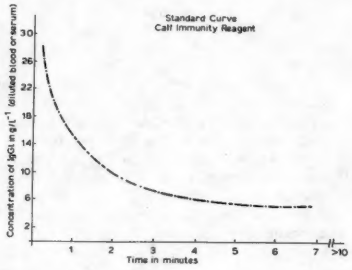
David J. Blackmore, Littleport, England, assignor to Ab-Ag Laboratories Limited, Cambridgeshire, England

Filed Jul. 23, 1985, Ser. No. 758,107

Claims priority, application United Kingdom, Jul. 24, 1984, 8418828

Int. Cl.[4] A61M *1/03*

U.S. Cl. 128—1 R **10 Claims**



1. A screening system for assessing passive immunity in a multiplicity of calves on the basis of assay results for blood samples, said system involving:

(a) collecting a blood sample from each of a multiplicity of calves;

(b) establishing and maintaining a correlation between results for each blood sample and the respective calf;

(c) contacting a predetermined volume of each blood sample with a predetermined amount of an anti-IgG, said contacting being effected under assay conditions which will visualize immunoreaction between Ig in said sample and said anti-IgG;

(d) monitoring said immunoreaction for each contacted blood sample to determine the presence ("positive result") or absence ("negative result") of a preset level of immunoglobulin G in each blood sample; and

(e) identifying calves which show a positive result and/or the calves which show a negative result.

4,592,339

GASTRIC BANDING DEVICE

Lubomyr I. Kuzmak, South Orange, N.J., and Frederick L. Coe, Santa Barbara, Calif., assignors to Mentor Corporation, Minneapolis, Minn.

Filed Jun. 12, 1985, Ser. No. 743,951

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 R **10 Claims**

1. A gastric band device for forming a stoma opening in a stomach comprising:

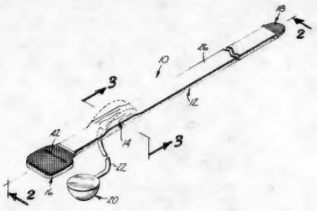
a longitudinal flexible substantially nonextensible band portion for encircling the stomach and for partitioning the stomach into a smaller upper portion and a larger lower portion;

means for securing said band to said stomach wall;

an expandable section located on the band portion adapted for positioning against a stomach wall; and

injection site means in fluid connection with the expandable

section wherein the expandable section is expandable or deflatable to decrease or increase the size of the stoma opening by addition or withdrawal of fluid through the injection site means.



4,592,340

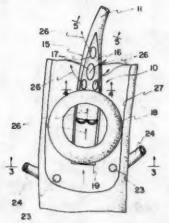
ARTIFICIAL CATHETER MEANS

Paul W. Boyles, 407 Glasgow Rd., Cary, N.C. 27511

Filed May 2, 1984, Ser. No. 606,255

Int. Cl.[4] A61B *19/00*; A61M *29/00*

U.S. Cl. 128—1 D **1 Claim**



1. A catheter for insertion into the arterial passage comprising: a flexible tube-like base member having an enlarged distal end portion, said distal end portion including side walls defining an open ended cavity; a plurality of side wall openings communicatively connecting said cavity with said arterial passage; inflatable balloon means encircling said enlarged distal end portion between said side wall openings and said open end of said cavity; self actuating valve means operatively disposed within said cavity permitting blood to flow from the open end of said cavity through the side wall openings while arresting flow in the opposite direction; air passage means communicating with said inflatable balloon means; and fluid passage means communicating with said distal end portion, whereby when said catheter is inserted into an arterial passage said inflatable means can be inflated to wedge the same against the vessel wall to both hold the same in place and to prevent undesirable blood backflow.

4,592,341

METHOD AND APPARATUS FOR GUIDING PROSTHESIS

Yasuhiko Omagari, Fuchu, and Tsutomu Okada, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed May 7, 1985, Ser. No. 731,539

Claims priority, application Japan, May 23, 1984, 59-75410[U]

Int. Cl.[4] A61B *17/00*; A61F *2/04*

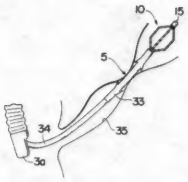
U.S. Cl. 128—4 **11 Claims**

1. A method of placing a prosthesis within a restricted passageway comprising the steps of:

a first step of inserting the front end of a flexible sheath, containing a guide member such as a guide wire extending therethrough, to the proximity of a restriction within the restricted passageway;

a second step of operating an operating unit which causes a movement of the guide member back and forth so as to open or close and thereby expand or shrink a resilient basket attached to the front end of the guide member and thereafter moving the basket past the restriction;

a third step of leaving the guide member which has moved past the restriction in place within the passageway while withdrawing the flexible sheath out of the passageway;



a fourth step of passing a prosthesis over the guide member, followed by passing a pusher tube over the guide member with, the pusher tube driving the prosthesis inward along the guide member;

a fifth step of driving the pusher tube inward to place the prosthesis within the restriction; and

a sixth step of withdrawing the guide member out of the passageway.

4,592,342

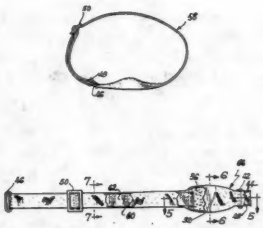
METHOD FOR APPETITE SUPPRESSION AND WEIGHT LOSS MAINTENANCE AND DEVICE

Samuel S. Salmasian, 2034 Hidden Crest Dr., El Cajon, Calif. 92020

Continuation-in-part of Ser. No. 490,317, May 2, 1983, abandoned. This application Jan. 3, 1984, Ser. No. 567,669

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 R **30 Claims**



1. An appetite suppression device which permits extended wear and is effective in causing weight loss comprising a body having a three-dimensional protuberance having an inwardly extending convex surface and an opposing outer surface which has a lesser degree of convexity and belt means for mounting said protuberance on a human being so as to exert pressure inwardly against a portion of the abdomen of the human being, said means being adapted to mount said protuberance between the navel and the sternum and approximately three fingers above the navel of the human being.

4,592,343

LARYNGOSCOPE

Michael S. Upsher, Burlingame, Calif., assignor to The Upsher Laryngoscope Corp., Burlingame, Calif.

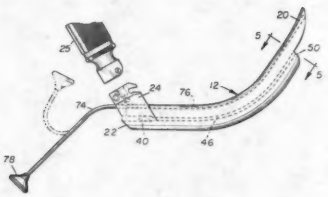
Continuation of Ser. No. 324,887, Nov. 25, 1981, Pat. No. 4,437,458. This application Dec. 30, 1983, Ser. No. 567,105

Claims priority, application European Pat. Off., Nov. 27, 1980, 80107427.9

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—11 **11 Claims**



1. A laryngoscope blade for use in a laryngoscope including a handle having battery means, a light source, first electrical contact means for electrically connecting said battery means to said light source for energizing the latter when said blade is disengagably connected with said handle in predetermined contacting relationship with said first contact means, and second electrical contact means for electrically connecting said battery means to a second light source on a second laryngoscope blade for energizing said second light source when the second blade is disengagably connected with the handle in predetermined contacting relationship with said second contact means, said first-mentioned laryngoscope blade comprising:

a blade body carrying a light guide and having a base section including means for disengagably connecting said blade body to said handle in contacting relationship with said first contact means for energizing said first light source while at the same time placing one end of said light guide in optical alignment with said first-mentioned light source, said base being configured so as not to contact said second contact means.

4,592,344

COMBINATION ILLUMINATOR AND LIP AND CHEEK EXPANDER

Peter M. Scheer, 420 Bond St., Redland, Calif. 92373

Continuation of Ser. No. 335,202, Dec. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 172,257, Jul. 25, 1980, abandoned. This application Dec. 14, 1983, Ser. No. 561,586

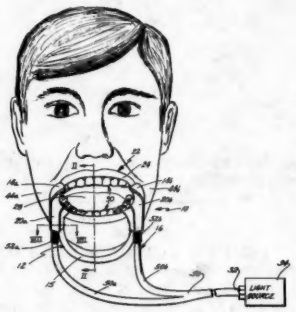
Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—13 **14 Claims**

1. A lip and cheek expanding device for holding a mouth in an open position and for conveying light from a source to the interior of the mouth around the teeth for illumination purposes comprising:

a lip expander for spreading the mouth and cheeks, said lip expander including a pair of lip engaging members of arcuate configuration, each having an inner surface with upper and lower portions shaped to engage portions of the upper and lower lips of the mouth, each having an outer surface portion in the shape of an arc facing the outer surface portion of the other, said lip expander further including means for connecting and positioning said lip engaging members one from the other to engage opposite corners of the mouth, said positioning means located outside of the mouth when said expanding device holds the mouth in the open position; and

each of said lip engaging members including a fiber optic light transmitting means having light outlet means located on the arc of said outer surface portion and intermediate said upper and lower portions; said fibers of light outlet means being arranged so as to be fanned and flattened out and arcuately shaped to extend a distance along said arc to produce an exposed fiber outlet edge extending a distance along said arc and facing inwardly toward those portions of the mouth around the teeth for projecting light over a



broad area of the teeth illuminating the portions to be examined and/or operated on when said lip and cheek expanding device holds the mouth in the open position; and light inlet means for connecting said light outlet to a light source whereby when said light outlet means is operatively connected to the light source the portions of the mouth are illuminated by light transmitted from the light source through said light transmitting means.

4,592,345

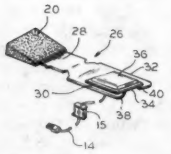
BACK MASSAGER STRUCTURE

Gregory S. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Filed Dec. 14, 1983, Ser. No. 561,557

Int. Cl.[4] A61H *23/02*

U.S. Cl. 128—33 **5 Claims**



1. A massager comprising:

a first padded portion to be located adjacent a first portion of the anatomy of an individual, and a second padded portion disposed at a spaced distance from said first padded portion, said second padded portion adapted to be located adjacent a second portion of the anatomy of said individual;

a semi-rigid frame member, said frame made from a substantially flat material, said frame member having a first portion extending beneath said first padded portion, and a second portion extending beneath said second padded portion;

said first portion of said second frame member comprising two extending arm portions and an open section between said arms defining a cut-out area;

a casing attached at the open section of said frame, said casing including therein vibratory means to create a vibrating motion in said frame member;

said second portion of said frame member comprising a substantially flat portion being shaped such that the external profile of said second portion of said frame member is substantially the same as the internal profile of said cut-out area of said first portion of said frame member;

whereby a portion of said vibrating motion is transmitted through said second portion of said frame member to said second padded portion and to said second portion of the anatomy of said individual, and another portion of said vibrating motion is transmitted through said first portion of said frame member to the first portion of the anatomy of said individual, and

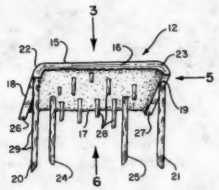
cover means enclosing said first and second padded portions and said semi-rigid frame member.

4,592,346

ORTHOPEDIC STAPLE

John A. Jurgutis, 506 Georgina Ave., Santa Monica, Calif. 90402

Filed Apr. 8, 1985, Ser. No. 721,207
Int. Cl.[4] A61F *2/28*
U.S. Cl. 128—92 B **8 Claims**



1. An orthopedic staple comprising:

(a) a rectangular top having front and rear longitudinal edges and left and right transverse edges;

(b) integrally formed downwardly depending front legs adjacent to the front corners at opposite ends of the front longitudinal edge of said top; and

(c) integrally formed downwardly depending rear legs spaced inwardly of the rear corners at opposite ends of the rear longitudinal edge of said top so as to be transversely offset from the front legs whereby bridging the bone grain so that said longitudinal edges of the top are at right angles to the grain minimizes the risk of splitting the bone when driving the legs of the staple into the bone.

4,592,347

RETRACTION DEVICE

Nimetullah M. T. Mahruki, Ortaköy, Palanga Cad. No: 15 Süreyya Ap., Istanbul, Turkey

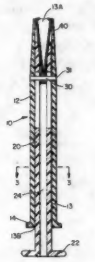
Filed Dec. 4, 1984, Ser. No. 678,063
Claims priority, application Turkey, Dec. 13, 1983, 146082
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—127 **16 Claims**

1. A reusable retraction device adapted to remove an object such as, for example, a vaginal sponge from a woman's vagina, said retraction device comprising:

an outer barrel open at its upper and lower ends with a longitudinally extending center aperture extending between said ends and a pin aperture extending transversely through the barrel and adapted to receive a retaining pin;

a tubular piston contained within said outer barrel and adapted to travel toward and away from the upper end of said barrel, said tubular piston being open at its upper end and having a T-shaped gripping handle at its opposed lower end which extends outwardly from the lower end of said barrel and in substantially the same plane as said barrel, said piston further including a pair of longitudinally extending, opposed keyway slots each proximately spaced from the upper end of the piston and adapted to permit said retaining pin to pass therethrough so as to capture the piston within said barrel; and

a spring-loaded retraction element provided within the open upper end of said piston, said retraction element having a



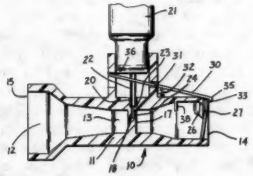
pair of gripping edges and including means for securing said retraction element to said retaining pin, said gripping edges being adapted to close when said piston is moved toward the upper end of the barrel and open when the piston is retracted from said upper end.

4,592,348

AEROSOL INHALER

William C. Waters, IV, 1255 Kingsley Cir., Atlanta, Ga. 30324, and Charles I. Wilmer, 922 Dean Dr., Atlanta, Ga. 30328

Filed Dec. 17, 1984, Ser. No. 682,604
Int. Cl.[4] A61M *11/00*
U.S. Cl. 128—200.23 **8 Claims**



1. An aerosol inhaler device for dispensing a metered amount of medication, including a housing, an air passage defined by said housing, an air inlet in communication with one end of said air passage, a mouthpiece in communication with the other end of said air passage through which a user inhales, and a means selectively actuated for dispensing a metered amount of aerosolized medication into said air passage, wherein the improvement comprises:

a valve disposed in said air passage and normally operative to substantially obstruct airflow by user inhalation through said air passage; and

means operative in response to actuation of said means for dispensing the aerosolized medication for permitting said valve to open by user inhalation, whereby unobstructed airflow through said air passage to said mouthpiece in response to inhalation by the user is permitted only in response to dispensinag the medication into said air passage.

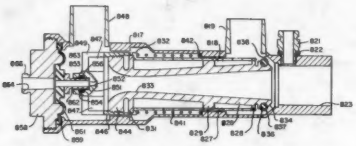
4,592,349
VENTILATOR HAVING AN OSCILLATORY INSPIRATORY PHASE AND METHOD

Forrest M. Bird, P.O. Box 817, Sandpoint, Id. 83864

Continuation-in-part of Ser. No. 291,622, Aug. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 269,929, Apr. 3, 1981, abandoned, and a continuation-in-part of Ser. No. 250,586, Apr. 3, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 516,133

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.25 **9 Claims**



1. In a combination venturi and exhalation valve assembly, a main body having a passageway therein extending axially thereof and providing a proximal airway port, a venturi body, means slidably mounting said venturi body in said pasageway in said main body for movement between first and second positions, means carried by the main body yieldably urging the venturi body toward said second position, said main body being formed with an expiratory port communicating with said passageway and being spaced from said proximal airway port, means forming a seal between the venturi body and the passageway of the main body between said airway port and said expiratory port when the venturi body is in the second position, said venturi body having a venturi-like passageway extending axially through the venturi body, means forming a nozzle carried by the venturi body and having a opening therein in axial alignment with the venturi-like passageway, said venturi body forming a nozzle communicating with said venturi-like passageway, said main body also being formed with an entrainment port in communication with said passageway in said main body and being located adjacent said entrainment opening, diaphragm carried by said main body and extending across the passageway in said main body, an end cap carried by the main body and having an inlet opening therein in communication with one side of the diaphragm, means forming a connection between the diaphragm and the means forming the nozzle, means for establishing communication between the inlet carried by the end cap and the means forming the nozzle and extending through the diaphragm whereby when gas is supplied to the inlet opening of the cap, gas is supplied to the means forming the nozzle to urge the diaphragm to move the venturi body from the first position to the second position thereby preventing flow between the airway port and the expiratory port, said means forming said nozzle being formed to permit the passage of air from the entrainment port through the entrainment port into the venturi-like passageway.

4,592,350
RESPIRATOR

Richard D. Maryyanek, Northbridge, and Joseph Z. Zdrok, Webster, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 493,664, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 439,930, Nov. 8, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 700,323

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—206.17 **6 Claims**

1. A respirator comprising:

a facepiece made of flexible material;

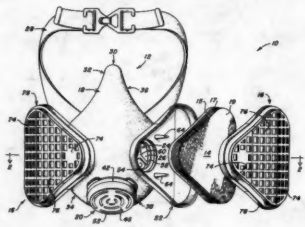
an exhalation valve positioned in front of said facepiece to allow air flow through the front of said facepiece;

a pair of inhalation valves with one inhalation valve being positioned in each opposed side of said facepiece to allow air flow through each opposed side of said facepiece;

said facepiece being designed so that it fits snugly to the contours of the wearer's face and only allows airflow through said valves when worn by a wearer;

a pair of triangular shaped filter housings being carried by said facepiece, each housing having a solid back defining an aperture in communication with each of said inhalation valves, said housing also having side walls around the perimeter of said solid back for containing a filter, when provided, within said walls; and

a pair of triangular shaped filter covers, one of said covers covering each of said filter housings and filters, when provided, said covers each having a perforated face which



allows air flow through said perforated faces into said apertures and on through said inhalation valves when the wearer inhales;

a first vertex of each triangular filter housing being oriented towards the center of the mask and towards the other first vertex so that said two vertices are the closest adjacent portions of said filter housings, each of said apertures also being positioned closer to said first vertex than to any other vertex of said triangular shaped filter housing, and

wherein each perforated face of said filter covers comprises three connecting surfaces, said surfaces forming an approximate convex curved shape which slopes in towards the respirator facepiece to reduce obstructions to the vision of the respirator wearer.

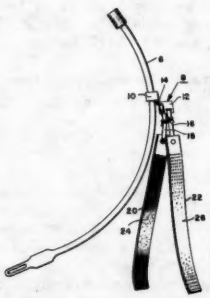
4,592,351
CANNULA HOLDER

Norma W. Smith, P.O. Box 319, Eagle Lake, Fla. 33830, and Jonathan K. Bolin, 714 Flagway St., Kissimmee, Fla. 32758

Filed Dec. 5, 1983, Ser. No. 558,017

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.17 **4 Claims**



2. A holder according to claim **1** in which the head band includes a first stretchable elastic portion connected directly at

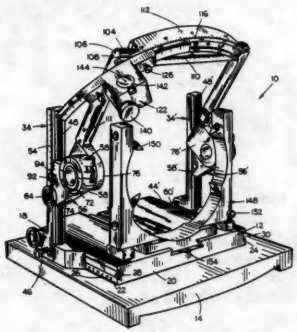
one of its ends to one end of the first strip, a second stretchable elastic portion connected directly at one of its ends to the other end of the first strip, a first flexible band attached to the end of one of said elastic portions remote from the first strip, and a second flexible band attached to the end of the other of said elastic portions remote from the first strip, said first and second flexible bands having interengageable means for attachment of said bands together to form a loop around the patient's head.

4,592,352

COMPUTER-ASSISTED TOMOGRAPHY STEREOTACTIC SYSTEM

Arun A. Patil, 1011 Valley View Dr., Minot, N. Dak. 58701

Filed Nov. 30, 1984, Ser. No. 677,080
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 B **12 Claims**



1. An apparatus for performing surgical procedures through a patient's skull to a target within the skull by utilizing a computer-assisted tomography scanner (hereinafter "CT scanner") comprising,

a base platform of material registerable on the CT scanner and having opposite sides and first and second ends,

means for removably mounting said base platform on the table of the scanner,

a vertically disposed support member selectively longitudinally movably mounted at each of said opposite sides of said platform,

said sides of said base platform having positioning indicia thereon for indicating the longitudinal positioning of said support members relative to said base platform,

an arc carrier support selectively vertically movably mounted on each of said support members,

an arc carrier selectively pivotally mounted on said arc carrier supports and extending upwardly therefrom,

said arc carrier comprising first and second spaced-apart legs having upper and lower ends and a top portion extending between the upper ends thereof, the lower ends of said legs being operatively pivotally secured to said arc carrier supports,

an arcuate arc selectively movably mounted on said top portion of said arc carrier for movement parallel to the pivotal axis of said legs, said arc having a radius greater than one-half the distance between said legs,

a probe holder assembly selectively movably mounted on said arc, said probe holder assembly having a cylindrical bore provided therein for receiving an elongated probe or the like,

the pivotal connection between said legs and said arc carrier supports being longitudinally offset from said support members towards said one end of said base platform,

said legs being longitudinally offset from said pivotal connection,

at least one of said arc carrier supports having vertical indicia thereon for indicating the pivotal axis of said pivotal connection,

said cylindrical bore in said probe holder assembly being positioned so that its longitudinal axis intersects the central axis of said pivotal connection between said legs and said arc carrier supports,

said base platform having a longitudinal groove centered therein, said groove registerable on the CT scanner and indicative of the lateral center of said platform,

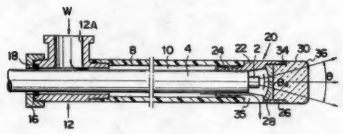
and a head holder assembly selectively longitudinally movably mounted on said base platform.

4,592,353

MEDICAL AND SURGICAL LASER PROBE

Norio Daikuzono, Ichikawa, Japan, assignor to Surgical Laser Technologies Ohio, Inc., Cincinnati, Ohio

Filed May 22, 1984, Ser. No. 612,674
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **9 Claims**



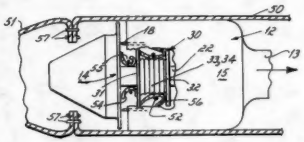
1. A medical and surgical contact laser probe for irradiating human tissue or the like, the laser probe having a forward end and defining a predetermined laser energy radiation area immediately adjacent the laser probe forward end whereby tissue subtended by said area may be irradiated, the laser probe including an optical fiber adapted for connection optically to a source of laser energy at a first end of the optical fiber and probe tip means consisting of laser transmissive material disposed in front of the second end of the optical fiber and means for securing the transmissive material in said front positions, the transmissive material extending from the securing means whereby the securing means remains clear of tissue when the transmissive material of the tip means is brought into contact with said tissue.

4,592,354

TISSUE RETENTION SPOOL FOR INTRALUMINAL ANASTOMOTIC SURGICAL STAPLING INSTRUMENT AND METHODS

Robert G. Rothfuss, Bellevue, Ky., assignor to Senmed, Inc., Cincinnati, Ohio

Filed Oct. 11, 1983, Ser. No. 540,895
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—305 **12 Claims**



1. In an intraluminal anastomotic surgical stapling instrument having a staple cartridge, a cylindrical scalpel within said cartridge, and a staple anvil mounted on a shiftable rod disposed within and extending from said staple cartridge in operable condition, said anvil being shiftable toward said staple cartridge for bringing ends of a transected tubular tissue structure together for stapling, the improvement comprising:

tissue retention means mounted on said rod and accessible between said staple cartridge and said anvil for holding an

end of a tubular tissue structure prior to and during an anastomotic procedure and wherein said tissue retention means is frictionally mounted on said rod and is yieldably slidable therealong between a first position disposed between said staple anvil and said staple cartridge for attachment of a closed tubular tissue structure thereto and a second position within said staple cartridge.

4,592,355

PROCESS FOR TYING LIVE TISSUE AND AN INSTRUMENT FOR PERFORMING THE TYING OPERATION

Eliahu Antebi, 22 Ehud Street, Tel Aviv 69936, Israel

Filed Jan. 17, 1984, Ser. No. 571,591
Claims priority, application Israel, Jan. 28, 1983, 67773
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—326 **3 Claims**

1. A process for ligating live tissue using an elongated strap having first and second ends, said process comprisising the following steps:

threading said first end of said strap through an apertured head in said second end of said strap thereby engaging teeth along the length of said strap with a pawl associated with said apertured head so as to lock the strap into a looped configuration;

placing the loop around the live tissue; and

pulling the first end of the strap so as to tighten the loop around the live tissure.

4,592,356

LOCALIZING DEVICE

Pedro Gutierrez, 141 Old Short Hills Rd., Apt. 125, West Orange, N.J. 07052

Filed Sep. 28, 1984, Ser. No. 655,414
Int. Cl.[4] A61B *17/06*
U.S. Cl. 128—339 **8 Claims**

1. A localizing device comprising:

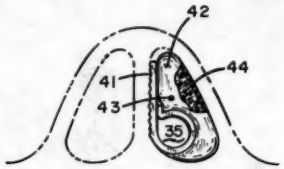
a needle for insertion into tissue, said needle including anchoring means at one end thereof for anchoring the needle in the tissue; and clamp means positioned at the other end of the needle for securing the needle at the outer skin surface.

4,592,357

SEPTAL SPLINT

Robert A. Ersek, Park St. David, 800 E. 30th St., Ste. 309, Austin, Tex. 78705

Continuation-in-part of Ser. No. 442,592, Nov. 18, 1983, Continuation-in-part of Ser. No. 265,963, May 21, 1981, Pat. No. 4,378,802. This application Sep. 17, 1984, Ser. No. 651,475
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—342 **5 Claims**



1. A septal splint for maintaining the nasal septum in planar alignment following a reconfiguration thereof, comprising in combination:

(a) a pair of generally rigid plate members, each of said plate members having two major side surfaces, one of said side surfaces being roughened to enhance its tissue gripping characteristics;

(b) an evacuable, contractable bag member containing an opened celled sponge, said bag member being attached to the other of said two major surfaces of each of said plate members;

(c) tubular airway means extending the length of each of said pair of plate members, said tubular airway means being attached to said plate members and at least partially surrounded by said bag member;

(d) means for evacuating said bag members to thereby compress said sponges prior to placement of said pair of plate members within the nasal openings with said roughened surfaces abutting the septum to be aligned; and

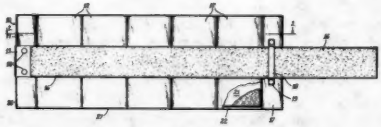
(e) means for exposing the interior of said bag members to atmospheric pressure, allowing said sponges to expand following placement of said pair of plate members within said nasal openings whereby the roughened surface of said pair of plate members are held in contact with the septum of either side thereof with a predetermined force.

4,592,358

THERAPEUTIC DEVICE

Wayne J. Westplate, 7612 - 33rd Ave., Kenosha, Wis. 53142

Filed Aug. 17, 1984, Ser. No. 641,825
Int. Cl.[4] A61F *7/08, 7/10;* A63B *21/12;* F25D *3/08*
U.S. Cl. 128—402 **15 Claims**



1. A therapeutic device comprising:

an elongated double layer of flexible, non-elastic liquid impervious material divided into a plurality of compartments and provided at both ends with a narrow compartment enclosing a stabilizing element;

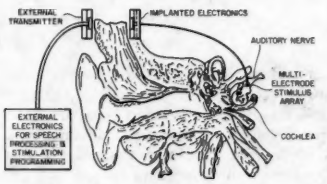
at least one said compartment containing therapeutic material;

at least one flexible, non-elastic strap means permanently fixed to one end of said device, a strap attachment means provided at said one end of said device and affixed to said device by fastening means passing through one of said stabilizing elements and a strap guide means provided at the opposite end of said device and affixed to said device by fastening means passing through the other of said stabilizing elements, whereby said device may be firmly positioned on a body portion.

4,592,359
MULTI-CHANNEL IMPLANTABLE NEURAL STIMULATOR

Douglas C. Galbraith, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 2, 1985, Ser. No. 719,231
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 R **9 Claims**

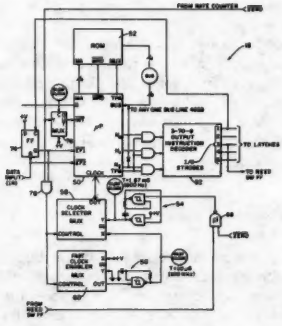


1. A neural stimulator comprising a transmitter, an implantable receiver and means for coupling the output of said transmitter to said receiver, said receiver including a plurality of output channels to the nerves of the wearer, said receiver including means for simultaneously addressing each of said channels in monopolar or bipolar mode, or alternatively in analog mode to stimulate said nerves.

4,592,360
IMPLANTABLE EXTERNALLY PROGRAMMABLE MICROPROCESSOR-CONTROLLED TISSUE STIMULATOR

Alan F. Lesnick, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Division of Ser. No. 195,665, Oct. 9, 1980, Pat. No. 4,424,812. This application Dec. 20, 1982, Ser. No. 451,598
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **8 Claims**



1. An implantable tissue stimulator, comprising

at least one stimulation electrode,

a slow clock,

a fast clock,

first and second presettable down counting means each producing a timed-output indicative of counting down to zero from a preset number, and each having a preset input and a clock input, said first and second counting clock inputs being connected to said slow clock and said fast clock respectively,

means for enabling said fast clock in response to said timed-out output of said first counting means,

logic means for beginning an output pulse in response to said timed-out output of said first counting means and ending said output pulse in response to the timed-out output of said second counting means,

means for applying a stimulation output pulse corresonding to said output pulse from said logic means to said electrode,

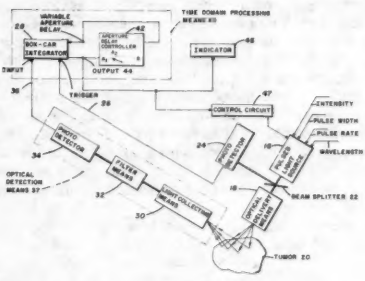
said means for enabling said fast clock including a fast clock enabler multiplexer having an output, and

a clock selector multiplexer having a first input connected to the output of said fast clock enabler multiplexer and having a second input connected to said slow clock, said clock selector multiplexer applying selectively either the fast clock or slow clock to a clock input of a microprocessor.

4,592,361
ELECTRO-OPTICAL DEVICE AND METHOD FOR MONITORING INSTANTANEOUS SINGLET OXYGEN CONCENTRATION PRODUCED DURING PHOTORADIATION USING PULSED EXCITATION AND TIME DOMAIN SIGNAL PROCESSING

John G. Parker, Olney, and William D. Stanbro, Columbia, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 393,188, Jun. 28, 1982, abandoned. This application Jul. 11, 1984, Ser. No. 629,879
Int. Cl.[4] A61B *6/00*; A61N *5/00*
U.S. Cl. 128—633 **80 Claims**



1. An apparatus for detecting singlet oxygen emission produced during photoradiation:

an optical excitation means for illuminating a portion of a medium containing a photodynamic sensitizer with intermittent intervals of optical excitation radiation;

an optical detection means for collecting light emitted from said medium and for detecting a composite emission signal in the 1.27 micron singlet oxygen emission band, whereby said composite signal includes a sensitizer fluorescent signal component and a singlet oxygen emission signal component, said sensitizer fluorescent signal component occurring essentially concurrently with said optical excitation radiation and said singlet oxygen emission signal component occurring at a time delayed from the occurrence of said optical excitation radiation;

a time domain processing means, operably coupled to said

optical detection means, for temporally separating said singlet oxygen emission signal component from said sensitizer fluorescent signal component, and,

a responsive means operably associated with said time domain processing means for indicating the magnitude of said singlet oxygen emission signal component.

4,592,362

LEG-SUPPORT FOR MAKING RESTRAINED-OBJECT X-RAY PHOTOGRAPHS OF THE KNEE JOINT

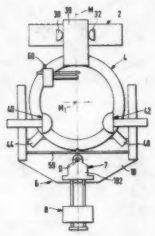
Hans-Werner Stedtfeld, Münster, and Michael Strobel, Lippstadt, both of Fed. Rep. of Germany, assignors to Hermann Ruf, Del.X

Filed Jun. 21, 1983, Ser. No. 506,353

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308063

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—653 **24 Claims**



1. Leg support means for receiving the knee joint and connecting parts of the thigh and lower leg of a patient for making restrained X-ray photographs of the knee joint, said leg support means comprising:

a base member;

a lower leg section mounted on said base member for receiving the lower leg of the patient;

a thigh section having two clamping posts mounted thereon for movement toward and away from each other for receiving the thigh of the patient therebetween;

a ring, the leg of the patient being adapted to lay across the ring with the knee joint located in alignment with the interior thereof when the lower leg and thigh of the patient are received in the lower leg section and thigh section, respectively, said ring being rotatably mounted on said base member and fastened to said thigh section for rotating said thigh section with respect to said lower leg section up to 90° on either side of a central position in which said lower leg section and thigh section are generally aligned; and

a foot member mounted on said base member for pivotal movement with respect to said lower leg section.

4,592,363

HIGH-FREQUENCY DEVICE FOR NUCLEAR SPIN RESONANCE APPARATUS HAVING A SURFACE COIL

Norbert Krause, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

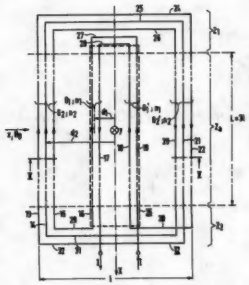
Filed Oct. 26, 1984, Ser. No. 665,175

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340384

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—653 **13 Claims**

1. Apparatus for at least one of generating a magnetic high-frequency field and receiving corresponding high-frequency signals in nuclear spin resonance apparatus, comprising high-frequency surface coil means arranged within an at least partially homogeneous magnetic field region of a magnetic field generated by a base field magnet means, said magnetic field having a predetermined orientation direction, said surface coil means being disposed either directly on one side of a surface of a body to be examined, or at least in the vicinity of said one side of said surface and generating an inhomogeneous magnetic field in said body, said surface coil means having a substantially rectangular shape and having a plurality of turn parts which are arranged at different geometric locations and which form a plurality of turns at least partially enclosing each other, each turn comprising a plurality of longitudinal conductor sections



and a plurality of transverse conductor sections which connect said longitudinal conductor sections at least partially together, said longitudinal conductor sections being arranged substantially perpendicular to the orientation direction of said magnetic field of the base field magnet means, the directions of current flow in parallel extending ones of the longitudinal conductor sections of adjacent turn parts being opposed to each other.

4,592,364

APPARATUS FOR THE DIAGNOSIS OF HEART CONDITIONS

John G. Pinto, 9426 Black Hills Ct., San Diego, Calif. 92129

Filed May 10, 1984, Ser. No. 608,798

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—672 **12 Claims**

1. An apparatus for analysing the biomechanical behaviour of a subject's cardiac muscle and for diagnosing its pathological conditions which comprises:

pressure sensitive means shaped and dimensioned to monitor the variation of blood pressure in one part of the subject's cardio-vascular system, and for generating electrical signals proportional to said blood pressure;

means responsive to said electrical signals for recording a plurality of values corresponding to successive blood pressure measurements during at least one cycle of the subject's systolic or diastolic pressure phase in relation to time;

electrical means for analysing said values and for mathematically deriving at least one critical parameter from the shape of the curve representing the plotting of said values versus time during said cycle and for interpreting said curve as a theoretical pressure-function (P) varying in time (t) with changes of ventricular volume (V) according to the phenomenological model equation:

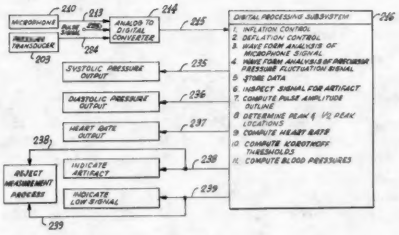
$$P(V,t)=B(V)t^{y}e^{-xt}$$

wherein B is a factor corresponding to the influence of the cardiac muscle size, y represents a first parameter, indicative of the excitation-contraction delay, and x represents the second parameter indicative of the inotropic characteristic of the muscle; and means for computing the x and y parameters which most closely fit the curve.

4,592,365
ELECTRONIC SPHYGMOMANOMETER

Heinz W. Georgi, Del Mar, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Aug. 10, 1981, Ser. No. 291,849
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—680 **100 Claims**



1. In an electronic sphygmomanometer, the combination comprising:

means for providing, from a first source, detected korotkoff sounds as electrical signals;

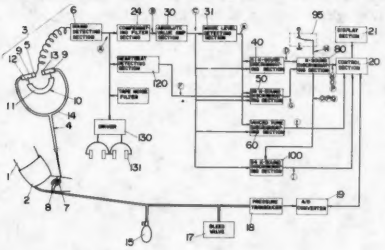
means for providing, from a second source, associated pressure waveform korotkoff sound precursors as electrical signals, each of said korotkoff sound precursors relating solely to the indivdidual korotkoff sound signal with which that precursor is associated; and

analyzing means for analyzing the waveforms of all of said electrical signals to determine their conformity with predetermined waveform characteristics, whereby those electrical signals having waveforms representative of true korotkoff sounds are separated from those electrical signals which do not represent true korotkoff sounds.

4,592,366
AUTOMATED BLOOD PRESSURE MONITORING INSTRUMENT

Yoshinori Sainomoto, Ikeda, and Fumio Kitagawa, Neyagawa, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 16, 1984, Ser. No. 600,413
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—680 **11 Claims**



1. An automated blood pressure monitoring instrument comprising:

means for externally occluding an artery with pressure;

transducer means responding to sounds including Korotkoff sounds emitted from the occluded artery for generating electric signals representative thereof;

filter means which receives the output signals from the transducer means to allow only the signals within a frequency range in the vicinity of the frequencies inherent to the Korotkoff sounds to pass as analog signals indicative of the intensities of the sounds sensed;

noise level detecting means which receives from said filter means the signals of different levels to calculate a noise level therefrom in such a manner as to exclude from said calculated noise level, expected levels which suggest the Korotkoff sounds and the like and which are higher than an estimated or assumed level of artifact noises emanating from the occluded artery and the body;

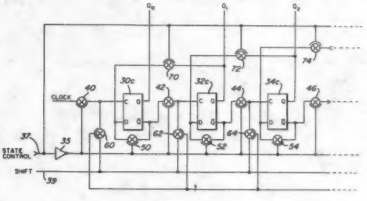
comparator means which successively receives the incoming signals from the filter means to compare their levels with a Korotkoff sound reference level which is defined to be proportional to said noise level determined and to be thereabove such that it provides a Korotkoff signal representative of the Korotkoff sound each time when the incoming signal is judged to have a greater level than the Korotkoff sound reference level; and

display means responding to the appearance and disappearance of the Korotkoff sound signal for providing blood pressure indications wherein said transducer means comprises a stethoscope with a pressure sensing pad adapted to be placed on the human body adjacent to the occluded artery, a microphone mounted within an ear plug of the stethoscope, a microphone sensitivity compensating filter means for providing a generally flat frequency response, and a frequency weighting filter means for adjusting the output from the microphone sensitivity compensating filter to an equal loudness contour which is characteristic to the human.

4,592,367
APPARATUS AND METHOD FOR DIGITAL RATE AVERAGING

Mir Imran, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Feb. 21, 1984, Ser. No. 581,904
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—706 **7 Claims**



1. A digital rate averaging circuit for determining the average periodic rate of a periodic signal made up of a series of pulses, said circuit comprises:

a plurality of stages for storing respective digits;

gate means responsive to a first state control signal for operatively interconnecting said stages to function as a shift register in a shift state, and responsive to a second state control signal for operatively interconnecting said stages to function as a counter in a count state;

input means periodically coupled to said plurality of stages by said gate means, said input means for receiving an event signal to be counted when said circuit is in the count state;

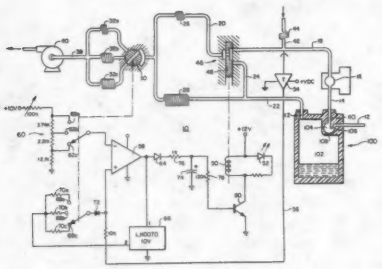
shift input means periodically coupled to said plurality of stages by said gate means, said shift input means responsive to a shift control signal for effecting a shift operation when said circuit is in the shift stage; and

means responsive to the pulses of said periodic signal for alternately producing said first and second state control signals.

4,592,368
GAS ANALYZER PROTECTION SYSTEM

Robert H. Ricciardelli, Waukesha, and Robert M. Sommer, Colgate, both of Wis., assignors to Biochem International Inc., Waukesha, Wis.

Filed Oct. 11, 1983, Ser. No. 540,803
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—719 **11 Claims**



1. In a gas analyzer of the type comprising a sample cell, a gas/liquid separator including an outlet port and an inlet port, a sample tube for conducting a gas/liquid mixture from a patient to the separator input port, and means for conducting gas from the separator output port through the sample chamber, the improvement comprising:

sensor means for measuring pressure in the conducting means and for generating a pressure signal in response thereto;

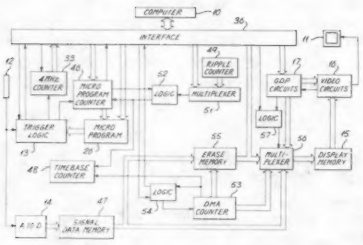
valve means for selectively permitting and interrupting flow of gas from the separator to the sample chamber; and

control means, responsive to the pressure signal, for automatically controlling the valve means to interrupt flow of gas from the separator to the sample chamber when the pressure signal enters a selected range of values indicative of excessive liquid in the separator.

4,592,369
METHOD AND APPARATUS FOR USE IN TEMPORAL ANALYSIS OF WAVEFORMS

Graham R. Davis, Gillingham, England, and Thomas I. H. Brown, Melbourne, Australia, assignors to National Research Development Corp., London, England

Filed Jul. 8, 1983, Ser. No. 511,891
Claims priority, application United Kingdom, Jul. 12, 1982, 8220215
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—733 **10 Claims**



1. Apparatus for indicating when a waveform satisfies selected conditions, comprising:

first and second comparator means for comparing the instantaneous value of the waveform with first and second reference values, respectively,

means for adjusting the first and second reference values,

means for generating a gating signal when the instantaneous value of the waveform has attained both a first predetermined relationship with the first reference value and a second predetermined relationship with the second reference value,

clock means for providing an indication of time,

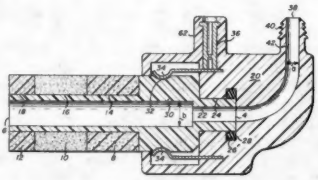
latch means for holding the value of the clock means at the instant the first predetermined relationship is satisfied, and

gate means for passing the contents of the latch means to output when the gating signal is generated.

4,592,370
EAR CANAL ELECTRODE FOR AUDITORY TESTING

John J. Lee, Cupertino; Arthur F. Avila, San Jose; Hal C. Danby, Palo Alto, and Myron A. Beigler, Los Altos Hills, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 424,353, Sep. 27, 1982, abandoned. This application Nov. 26, 1982, Ser. No. 444,624
Int. Cl.[4] A61B 5/12
U.S. Cl. 128—746 **27 Claims**

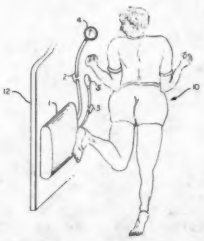


12. An ear canal electrode in combination with a connector means, the ear canal electrode comprising a tube having an annular recess means on the outer surface thereof for releasably engaging a retention spring means of the connector means, the connector means having an electrode receiving recess means for receiving the electrode and retention spring means associated therewith for releasably engaging the annular recess means, wherein the connector means has an auditory signal transmitting passageway for communicating with the inner pasageway of the electrode tube.

4,592,371
MUSCLE TESTING METHOD

Russell A. Pellicano, N. Bay Shore, N.Y., and Daniel DelGiorno, Fort Lee, N.J., assignors to Prestigeline Health Products Inc., Brentwood, N.Y.

Filed Sep. 24, 1984, Ser. No. 621,162
Int. Cl.[4] A61B 5/10
U.S. Cl. 128—774 **3 Claims**



1. An objective method of testing a muscle for comparative strength and endurance in a person comprising the steps of

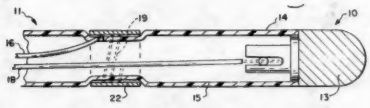
fixedly supporting and pressurizing a sealed container with a gas to a predetermined pressure thereby rendering said container compressible, allowing said person to press a limb in one direction only against said container to compress said container thereby raising the pressure therewithin, recording the highest pressure maintained by said person for a predetermined specific period of time, and subsequently repeating the aforesaid steps to obtain comparative information.

4,592,372

PACING/SENSING ELECTRODE SLEEVE AND METHOD OF FORMING SAME

William J. Beranek, Cooper City, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 22, 1984, Ser. No. 612,855
Int. Cl.⁴ A61N *1/04*
U.S. Cl. 128—786 **13 Claims**



1. A pacing/sensing lead comprising a catheter; first and second conductors in said catheter; a tip electrode fixed to the distal end of said catheter and in electrical contct with a distal end of said first conductor within said catheter; said catheter having an opening in the wall thereof; a bared end portion of said second conductor extending through said opening, out of said catheter, and around said catheter; a thin walled electrode sleeve made of rhenium/tungsten alloy positioned about and in direct electrical contact with said bared end portion of said second conductor and compressed about said conductor end portion and said catheter to an extent where the outer diameter of said sleeve is substantially in the same as the outer diameter of said catheter, said alloy having as its major component at least 80% rhenium by weight.

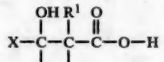
4,592,373

SMOKING COMPOSITIONS

Yoram Houminer, Richmond, and Harvey J. Grubbs, Mechanicsville, both of Va., assignors to Philip Morris Inc., New York, N.Y.

Division of Ser. No. 204,974, Nov. 7, 1980, abandoned. This application Oct. 27, 1983, Ser. No. 519,785
Int. Cl.⁴ A24B *3/12, 15/30, 15/38*
U.S. Cl. 131—276 **7 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco, non-tobacco substitutes, and mixtures thereof, and (2) between about 0.00001 and 2 weight percent, based on the total weight of filler, of a heterocyclic-hydroxy-substituted carboxylic acid compound corresponding to the formula:



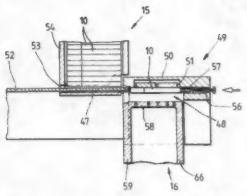
wherein X is a heterocyclic substituent containing between about 2–12 carbon atoms, and any heteroatom in X is selected from oxygen, nitrogen and sulfur; R is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms; R^1 and R^2 are hydrogen or substituents selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms, and R^1 and R^2 when taken together with connecting elements form an alicyclic structure; or a corresponding salt form of the said carboxylic acid compound.

4,592,374

PROCESS AND APPARATUS FOR FORMING GROUPS OF CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,197
Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120674
Int. Cl.⁴ A24C *5/35*
U.S. Cl. 131—282 **5 Claims**



1. Apparatus for the extraction of bar-shaped articles, particularly cigarettes, from out of a cigarette magazine with cigarette shafts lying next to one another, said cigarettes being supplied by said magazine for extraction in upright individual rows and for delivery of the extracted cigarettes onto an endless conveyor (**16**) laterally offset and underneath said cigarette magazine, said apparatus including a pusher (**52**) for pushing a batch (**48**) of cigarette shafts laterally out of the lower area of the magazine housing the cigarette shafts, and a delivery unit for transport of the cigarette batches (**48**), respectively, onto said endless conveyor, the improvement wherein:

said endless conveyor directly underlies said delivery unit, and said pusher (**52**) projects into said delivery unit to cause the batch (**48**) of cigarette shafts to move into a position above said endless conveyor (**16**), and

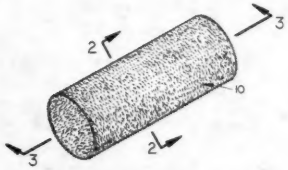
means for causing said delivery unit to take up said batch of cigarettes and deposit them onto said endless conveyor (**16**).

4,592,375

HAIR CURLING ROLLER

John K. Beier, 901 S. 89th, Omaha, Nebr. 68114

Filed Jan. 27, 1984, Ser. No. 574,408
Int. Cl.⁴ A45D *2/02*
U.S. Cl. 132—39 **4 Claims**



1. An elongated cylindrical hair curling roller comprised of polyester fibers bound together by a binder material so that said fibers and binder material will yieldably tend to retain the cylindrical shape and density of said roller free of any separate stiffening member.

4,592,376

HAIR DYE APPLICATING APPARATUS

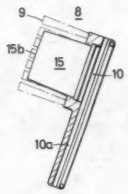
Ludwig Sigmund, Pfungstadt; Franz Steigerwald, Griesheim, and Karlheinz Zulauf, Höchst-Hassenroth, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,704

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013769

Int. Cl.[4] A45D *24/22*

U.S. Cl. 132—112 15 Claims



1. A hair dye applicating apparatus, comprising a handle part formed as a hair dye supply container having a longitudinal axis; a combination part connected with said supply container and having a hair separating tip arranged in spaced relationship with said supply container and extending at an acute angle to said longitudinal axis, a comb member with a plurality of tines and arranged adjacent to said supply container, and a hair dye application part including a brush member with a plurality of bristle bundles extending at an acute angle to said longitudinal axis and an elastic hollow slot-shaped nozzle member located inside said brush member so as to be surrounded by said bristle bundles at its both longitudinal sides and to form an outlet opening to supply a hair dye to tips of the bristle bundles; and means forming a throughgoing opening between said supply container and said brush member of said combination part, said application part of said combination part being displaceable between one position in which said throughgoing opening is closed and another position in which it is open.

4,592,377

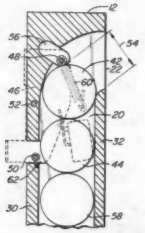
COIN ESCALATOR

Craig A. Paulsen, and Thomas R. Meier, both of Reno, Nev., assignors to IGT, Reno, Nev.

Filed Jul. 2, 1984, Ser. No. 626,946

Int. Cl.[4] B80B *7/00;* B08B *7/00;* G07F *3/02;* A47F *1/04*

U.S. Cl. 133—5 R 19 Claims



1. A coin handling apparatus for receiving coins at a first location and discharging the coins at a second location through a coin discharge slot remote from the first location, the apparatus comprising:

means defining a coin transport channel extending from the first location to the second location and dimensioned so that coins can move therein in a single, edge-to-edge file, the channel terminating at the coin discharge slot at the second location; and

security means disposed within the channel and in contact with at least a first coin disposed proximate the slot and a second coin relatively remote from the slot for preventing a discharge of the first coin through the slot unless the first and second coins move simultaneously and with substantially equal speeds toward the slot.

4,592,378

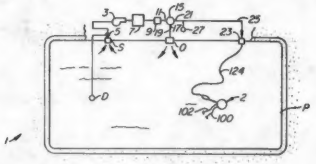
LOW PRESSURE POOL CLEANER SYSTEM

Herman E. Frentzel, 18 S. Ridgewood Rd., Kentfield, Calif. 94904

Division of Ser. No. 541,193, Jan. 12, 1983, Pat. No. 4,526,186. This application Mar. 6, 1985, Ser. No. 708,756

Int. Cl.[4] B08B *3/02, 9/08*

U.S. Cl. 134—111 7 Claims



1. A pool cleaning system of the type using a water jet type of pool cleaner having a drive unit, the drive unit having a fluid inlet, the system being used to clean a pool of the type having a water inlet connected to the inlet of a pump, a main filter connected to the pump's outlet, and a main pool outlet, the improved system comprising:

a flow director valve having an inlet coupled to the outlet of the main filter, a first outlet coupled to the main pool outlet and a second outlet fluidly connected to the drive unit fluid inlet;

said flow director valve having a slidable piston means which functions to automatically divide the water from the main filter to the first and second outlets according to the pressure at the flow director valve inlet.

4,592,379

FLUID DISTRIBUTION VALVE

John M. Goetti, Phoenix, Ariz., assignor to George J. Ghiz, Phoenix, Ariz.

Filed Apr. 27, 1984, Ser. No. 604,862

Int. Cl.[4] F16K *11/14*

U.S. Cl. 137—119 12 Claims

1. A fluid distribution valve comprising,

a flow compartment and a control compartment separated from each other,

inlet flow means in said flow compartment, a series of outlet flow means in said flow compartment,

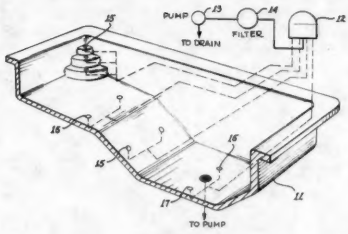
valve means disposed in each of said series of outlet flow means for opening and closing same and adapted for opening due to the pressure in said flow compartment applied against one side thereof,

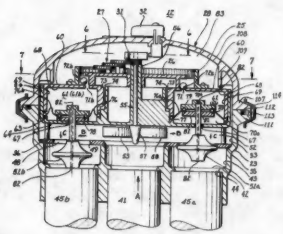
an impeller in said flow compartment and adapted for rotation flow therein,

valve operating means having two sides for each of said valve means disposed in said control compartment, said valve operating means being adapted for closing said valves against the pressure in said flow compartment due to the pressure in said flow compartment, applied to one side thereof, whereby said valve means opens upon failure of said valve operating means,

means for applying flow compartment pressure to said one side,

means for supplying pressure from said flow compartment to said control compartment, and





means in said control compartment controlled by rotation of said impeller for applying and removing said control compartment pressure to the other side of said valve operating means.

4,592,380

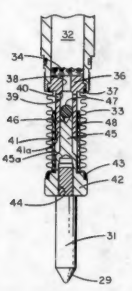
GAS LIFT VALVE

Eddie J. Hamm, The Colony, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 516,650, Jul. 25, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 725,568

Int. Cl.⁴ F04F *1/08*

U.S. Cl. 137—155 **11 Claims**



1. A gas lift valve comprising,

a body,

a main valve seat in the body,

a main valve member cooperable with the seat to control flow through the body,

a pressure dome including a depending bellows connected to said valve member,

said bellows being exposed to pressure within the dome urging said valve member toward said seat and to pressure exterior of said body urging said valve member away from said seat,

an internal valve seat between said bellows and the remainder of said dome,

an internal valve member separate from and movable relative to and supported on said main valve member and cooperable with said internal valve seat to control flow therethrough,

one of said internal valve member and seat constructed of polyimide material,

hydraulic fluid in said dome extending to a level above said internal valve seat, and

a sleeve of polyimide material having a sliding engagement with the interior of said bellows and supporting said bellows against distortion when subjected to a differential pressure thereacross.

4,592,381

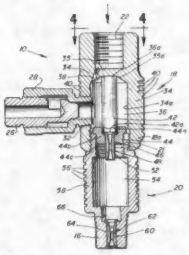
MULTIPLE STAGE DEVICE FOR CONDENSATE REMOVAL FROM A STEAM PIPING SYSTEM

Michael Troy, Westmont, Ill., assignor to Engineering Resources, Inc., Chicago, Ill.

Filed Feb. 7, 1984, Ser. No. 577,687

Int. Cl.⁴ F16T *1/34*

U.S. Cl. 137—203 **11 Claims**



1. A device for drainage of condensate from a steam piping system with minimized passage of live steam comprising:

A. a body having a conduit therethrough provided with an inlet and outlet, said body including a peripheral wall having an exterior surface exposed to ambient atmosphere;

B. at least first and second constricted passageways within said body communicating with said conduit for constricting the flow of a mixture of condensate and steam flowing therethrough;

C. an expansion and cooling chamber defined by said peripheral wall communicating between said first and second passageways and dimensioned to enable expansion and reduction in the pressure of steam flowing from said first passageway into said chamber prior to constriction of the flow of condensate and any remaining steam flowing downstream into said second passageway, said first passageway being formed through an internal wall positioned between said inlet and said chamber, said first passageway and said chamber having internal cross-sectional areas which differ by at least one order of magnitude;

D. said chamber operable to transfer heat to ambient atmosphere through said wall whereby to effect condensation of steam in said chamber, and including filter means in said chamber for filtering particulate debris from said mixture of steam and condensate flowing through said chamber, said filter means comprising a cylindrical filter screen supported at one end thereof by said internal wall substantially centered in said chamber and at the other end by means supporting said second constricted passageway, said first passageway communicating with said chamber externally of the filter screen; and

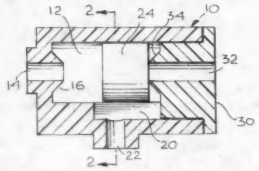
E. a blow-off valve assembly connected to said body, said assembly including a channel having a fluid entrance communicating with said first chamber for purging debris accumulated by said filter means.

4,592,382

ANTI-SIPHON NOZZLE

Sol R. Rubin, Beverly Hills, and Joseph D. Robinson, Gardena, both of Calif., assignors to Aqua-Giene, Inc., Los Angeles, Calif.

Filed Aug. 27, 1984, Ser. No. 644,787
Int. Cl.[4] F16K *24/00*
U.S. Cl. 137—218 **16 Claims**



1. An anti-siphon valve comprising:

a housing having an end wall closing one end and being open at the other end;

said housing also having side walls defining a cylindrical bore extending to said end wall and further defining a recess extending radially outward from only one side of said cylindrical bore and alongside a portion only of the length of the cylindrical bore from said open end to a point displaced from said end wall;

an end plug configured to fit the cross section of said cylindrical bore and said recess and being mounted in the open end to close said open end and define respective cylindrical and recessed chambers open to each other along their common extent;

the end wall defining an inlet passage extending generally axially of said bore for admitting liquid into the cylindrical chamber;

the plug defining an air vent extending generally axially of said bore for admitting air into the cylindrical chamber;

said housing sidewalls defining an outlet passage for transmitting liquid from said recessed chamber as it is admitted into the cylindrical chamber via said inlet passage; and

a free floating cylindrical piston mounted for axial movement along said cylindrical chamber between a first position closing the air vent and a second position closing the inlet passage, said piston being responsive to a drop in fluid pressure within said cylindrical chamber to move to said second position.

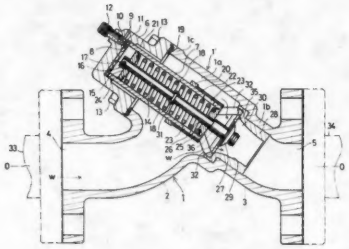
4,592,383

CONSTANT-FLOW VALVE

Sotokazu Rikuta, c/o Nippon Flow Cell Seizo Kabushiki Kaisha, 1-24-15, Shingashi, Itabashi-ku, Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,955
Claims priority, application Japan, May 16, 1984, 59-098169
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—454.6 **11 Claims**

1. A constant flow valve comprising a valve body means having an inlet portion, an outlet portion and a main valve body portion, said inlet portion and said outlet portion being connectable within the run of a fluid pipe line, said main valve body portion being interposed between said inlet portion and said outlet portion, said main valve body portion having an open end, a cap member on said open end, and valve means disposed in said main valve body portion for maintaining a constant flow rate through the valve body means regardless of pressure differential between said inlet portion and said outlet portion, said valve means and said main valve body portion being constructed and arranged such that said valve means is removable from and replaceable in said main valve body portion by removing said cap member from the main valve body portion by passing said valve means through said open end of said main valve body portion, said valve means being removeable from and replaceable in said main valve body portion while the valve body means remains connected within the run of said fluid pipe line, said main valve body portion having a passage



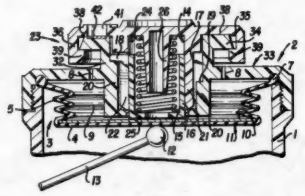
extending from said open end, said passage having an axis extending at an obtuse angle relative to the axis of said outlet portion, said valve means comprising a cylinder means coaxially disposed within said passage of said main valve body portion, said valve means further comprising a valve plate at one end of said cylinder means, said valve plate having a central opening, said valve means further comprising a valve stem movable in said cylinder means and having an inner valve, said valve stem passing through said central opening, said inner valve being disposed outside said cylinder means.

4,592,384

COMMUTATOR FEEDING DEVICE FOR A DEMAND VALVE INTENDED FOR INTRODUCING BREATHABLE AIR INTO A COMPRESSED AIR BREATHING APPARATUS

Giulio Cappa, Milan, and Romano Moscatelli, Rome, both of Italy, assignors to Sekur S.p.A., Milan, Italy

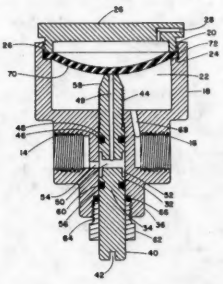
Filed May 18, 1984, Ser. No. 611,888
Claims priority, application Italy, May 19, 1983, 21177 A/83
Int. Cl.[4] A61M *16/00*
U.S. Cl. 137—494 **9 Claims**



1. A commutator device for a demand valve intended for feeding breathable air into a compressed air breathing apparatus, particularly inside the mask of said compressed air breathing apparatus, said demand valve comprising a transducer for controlling the movements of a shutter element for feeding predetermined quantities of air into a chamber of said demand valve, following a pressure variation inside chamber, said transducer being activated by the shifting of a deformable membrane adapted for adjusting to the pressure which exists in said chamber, said device being adapted for commutating said demand valve from (i) one configuration wherein, on a first surface of said membrane, the pressure existing inside said

chamber acts and wherein, on a second surface of the membrane itself, the atmospheric pressure acts, and to (ii) a second configuration wherein, on said second surface, a prefixed force generated by a spring is also caused to act, characterized in that said spring is disposed inside of a small piston adapted for resting upon said second surface of said membrane and by being axially mobile inside a cylindrical hole made in a cover of the casing of said demand valve, said small piston being provided with radial stakes, each one of which is adapted to rest upon the active surface of a corresponding cam having a helicoidal profile made on the lateral surface of said cylindrical hole, with manual activating means being adapted and arranged for controlling the rotation of said small piston around its own axis, and hence, the axial shifting of said small piston itself, in the spring compressing sense, for converting said demand valve from said second configuration into said first configuration.

4,592,385
VACUUM REGULATOR VALVE
Albert L. Semon, 11 Eliot Pl., Short Hills, N.J. 07078
Filed Apr. 8, 1985, Ser. No. 721,159
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—505.13 **1 Claim**



1. An adjustable vacuum regulator valve comprising a valve body having an inlet port and outlet port;

a removably secured threaded cap for said valve body cooperting with said valve body in defining a chamber within said valve body, said removably secured cap of said valve body containing an atmospheric vent passageway;

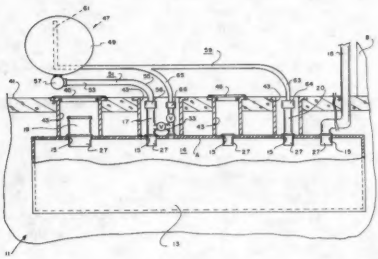
a flexible diaphragm secured within said chamber defined by said valve body and said removably secured cap;

an adjustable needle-nose stem valve vertically movable, longitudially disposed within said valve body having a vertical longitudinal passageway therethrough for communication between said inlet port and said chamber, said adjustable needle-nose stem valve having a circumferential annular indent in coopertion with said vertical lonitudinal passageway in said adjustable needle-nose valve to permit said longitudinal vertical passageway to be in communication with said inlet port when said adjustable needle-nose stem valve is rotatably positioned upwardly or downwardly within said valve body, said adjustable needle-nose stem valve cooperating with said flexible diaphragm to set vacuum;

means for securing said adjustable needle-nose stem valve comprising a lock nut secured to said adjustable needle-nose stem valve and cooperating with said valve body to secure said adjustable needle-nose stem valve in the desired position;

means for communication between said chamber and said outlet port said means for communication comprising a passageway of said valve body.

4,592,386
TANK OVERFILL PROTECTION MEANS
Joseph R. Mooney, 33 Hawk St., New Orleans, La. 70124
Filed Jun. 12, 1985, Ser. No. 744,025
Int. Cl.[4] F16K *24/00;* **B65B** *31/00*
U.S. Cl. 137—588 **3 Claims**



1. An underground liquid storage tank comprising:

(a) an underground hollow body member for holding a quantity of liquid;

(b) a fill pipe attached to said body member and communicating with the interior thereof for allowing liquid to pass therethrough into the interior of said body member;

(c) a vent pipe attached to said body member and communicating with the interior thereof for allowing air to pass therethrough from the interior of said body member;

(d) air trap means mounted within the interior of said body member for preventing said body member from being completely filled with liquid through said fill pipe; said air trap means including a downwardly extending cylindrical skirt attached to said fill pipe and including a downwardly extending cylindrical skirt attached to said vent pipe;

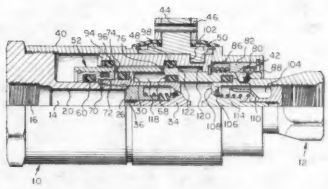
(e) a bleeder vent pipe attached to said body member adjacent said fill pipe and communicating with the interior of said body member for allowing air to pass therethrough from the interior of said body member adjacent said skirt attached to said fill pipe;

(f) a cross over pipe extending between said bleeder vent pipe and said fill pipe for allowing fluid to pass therethrough between said fill pipe and said bleeder vent pipe and the interior of said body member;

(g) a first valve means mounted in said bleeder vent pipe for selectively closing said bleeder vent pipe, and

(h) a second valve means mounted in said cross over pipe for selectively closing said cross over pipe.

4,592,387
POWER-ASSISTED COUPLING
Russell L. Rogers, Munith, Mich., assignor to Aeroquip Corporation, Jackson, Mich.
Filed Sep. 9, 1985, Ser. No. 774,034
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.06 **8 Claims**



1. A manually operated power-assisted fluid coupling for

interconnecting fluid systems comprising, in combination, a female part having an axial passage having an inner end connectable to a first pressurized fluid system and an open outer end, a first self-sealing valve within said passage at said outer end, a male part having an axial passage having an inner end connectable to a second fluid system and an outer end adapted to be sealingly received within said female part outer end and having an end pressure face, a second self-sealing valve within said male part passage at said outer end thereof, a tubular sleeve concentrically mounted within said female part about its passage for axial displacement in a release position to a release position and in a couple direction to a fully coupled position, said sleeve having an open end adjacent said female part outer end and sealingly receiving said male part outer end, releasable lock means defined on said sleeve adjacent its open end, lock receiving means defined upon said male part outer end receiving said lock means, a lock actuator defined on said female part selectively engaging said lock means with said lock receiving means and releasing said lock means from said lock receiving means when said sleeve is in said release position, first and second expansible chamber motors defined on said female part operatively connected to said sleeve, a first fluid circuit connecting said first motor to said first pressurized fluid system, a second fluid circuit selectively connecting said second motor to said first pressurized fluid system and exhausting said second motor, a manual actuator mounted upon said female part movable between first and second positions and in couple and release directions, a valve movably mounted on said female part operatively connected to said manual actuator and controlling fluid flow through said second fluid circuit, said valve being engagable with said sleeve upon said manual actuator moving in said release direction, said first and second manual motors having substantially equal pressure faces of larger area than that of said male part end pressure face, said first motor biasing said sleeve in said couple direction, said second motor biasing said sleeve toward said release position, said first position of said manual actuator exhausting said second motor permitting said first motor to displace said sleeve in said couple direction to said fully coupled position drawing said male part into said female part passage causing said first and second self-sealing valves to engage and open to establish communication between said passages of said female and male parts, said second position of said manual actuator pressuring said second motor by said second fluid circuit to substantially balance the effect of said motors upon said sleeve, movement of said manual actuator in said release direction engaging said valve with said sleeve to displace said sleeve to said release position.

4,592,388

CONNECTOR ASSEMBLY FOR SWIVEL TYPE FAUCET SPOUT

Thomas J. Wilcox, East Troy, Wis., assignor to Indiana Brass, Inc., Frankfort, Ind.

Filed Feb. 11, 1985, Ser. No. 700,280

Int. Cl.[4] F16L *27/00*

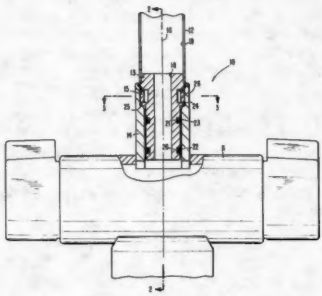
U.S. Cl. 137—615 **17 Claims**

1. A connector assembly for connecting a faucet body to a swivel spout, comprising:

a spout hub fixedly attached to said spout and defining a first through passageway in flow communication with said spout;

a spout socket defining a second through passageway within which said spout hub is rotatably received, said spout socket connected to said faucet body so as to permit said spout to swivel relative to said faucet body as said spout hub rotates in said spout socket, said spout socket further having a side opening communicating between said second through passageway and the exterior of said spout socket; and

a lock ring including a resilient flexible collar extending at least partially around said spout hub, said lock ring further including a pin integrally formed with and projecting outwardly from said collar, said collar urging against said spout socket along said second passageway thereby urging said pin within said side opening without said pin extending outwardly of said side opening exteriorly of said faucet, whereby, said lock ring limits longitudinal movement of said spout hub relative to said spout socket



by interference contact between said spout socket and said pin within said side opening while also permitting smooth swivel movement of the spout during faucet operation by distributing the area of moving contact between said spout hub and said lock ring along said collar.

4,592,389

ROTARY VALVE

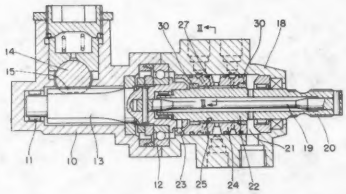
Ryuichi Yamada, Aichi; Toshio Hirokawa, and Toshihiro Goto, both of Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

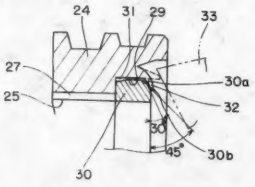
Filed Mar. 20, 1985, Ser. No. 713,822

Claims priority, application Japan, Mar. 22, 1984, 59-41649[U]

Int. Cl.[4] F16K *11/22*; F16C *33/02*

U.S. Cl. 137—625.22 **2 Claims**





1. A rotary valve, comprising:

a valve sleeve having a cylindrical internal cavity and a plurality of axial grooves formed on a wall surface of said internal cavity;

a valve spool fitted in said internal cavity of said valve sleeve and rotatable relative to said valve sleeve for controlling flow of a pressurized fluid through said valve;

an annular groove formed at least at one end of said valve sleeve and having a diameter greater than that of said internal cavity;

a bush fitted in said annular groove and having a hole formed therein of the same diameter of said internal cavity and a chamfered surface formed at an outer cover edge of said bush;

seal means interposed between engaging surfaces of said bush and said annular groove; and

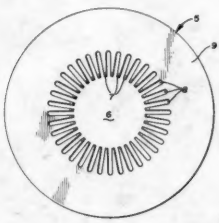
an annular thin wall portion formed at the end of said valve sleeve and bent radially inward to retain said bush in said annular groove wherein said chamfered surface includes a first chamfered surface inclined at a first angle within an outer end face of said bush and a second chamfered surface formed contiguously with said first chamfered surface at a second angle with said outer end face of said bush, said second angle being greater than said first angle.

4,592,390

FLOW WASHER

Richard M. Boyd, St. Louis Park, Minn., assignor to Minnesota Rubber Company, Minneapolis, Minn.

Filed Apr. 23, 1984, Ser. No. 602,934
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—45 **15 Claims**



1. A flow washer comprising:

(a) a flow control member constructed and arranged to be disposed within a flow washer seat of a water conduit to control the flow of water therethrough at a substantially constant volume throughout the pressure range of a conventional water supply connected to the conduit;

(b) said flow control member being constructed throughout of a flowable flexible resilient material resistant to prolonged periods of time within water and being of substantially uniform axial dimensions throughout, said flow-control member having an orifice extending axially and centrally therethrough;

(c) said flow-control member being comprised of an annular outer wall;

(d) a plurality of spaced but closely adjacent thin fins extending radially inwardly from said wall, said fins having free end portions defining said orifice therebetween and extending entirely within the general plane of said wall; and

(e) said fins being spaced from each other by slots having widths within a range of 0.0125 inches to 0.0165 inches and having widths within the range of 0.002 to 0.007 inches at their free end portions.

4,592,391

TUBE SLEEVE

Timothy H. Wentzell, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 19, 1984, Ser. No. 572,031
Int. Cl.[4] F16L *55/12, 55/16*
U.S. Cl. 138—98 **3 Claims**

1. A repair sleeve assembly located entirely within a tube, comprising:

a generally cylindrical, hollow tension member (18) having an enlarged head (26), a lower, externally threaded stem (28) and an enlongated body portion (30) intermediate the head and stem, said stem and body portion having substantially the same outer diameter;

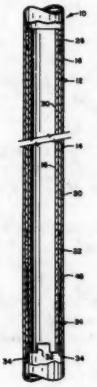
a generally elongated, cylindrical nut member (24) having a threaded portion engaging said threaded stem (28);

a generally cylindrical ring member slideably surrounding said body portion (30) and adapted to advance along said body portion as said nut member (24) advances along the stem (28);

a generally cylindrical, hollow compression sleeve member (20) surrounding said body portion (30) between said head (26) and said ring (22), wherein;

(a) said nut member (24), ring member (22) and sleeve member (20) form a segmented sheath of substantially uniform outer diameter around the stem (28) and body (30) portions of the tension member (18);

(b) said head and the upper end of the sleeve member have oppositely facing, overlapping tapered surfaces (50, 54);



(c) said ring and the lower end of the sleeve member have oppositely facing, overlapping tapered surfaces (56, 52);

(d) said stem portion has slotted rim means (32) at the lower end thereof for maintaining the tension member stationary while the nut member is rotated along the stem;

(e) said nut member has slit rim means (34) on the lower end thereof for rotating the nut along the stem, such that;

said tension member (18), compression sleeve member (20), and ring member (22) are operatively arranged whereby when the tension member is drawn downward relative to the nut, the oppositely facing tapered surfaces (50, 54 and 56, 52) advance wedge-like over each other, radially expanding the upper and lower circumferential outer surfaces at the ends of said sleeve into deformed circumferential contact with the adjacent tube wall (16), forming respective upper and lower seals thereagain.

4,592,392

SHOT SEEKING MECHANISM FOR WEAVING LOOMS

Michel Vandeweghe, Heuvelland, and Jan F. Derde, Ieper, both of Belgium, assignors to N.V. Weefautomaten Picanol, Ieper, Belgium

Filed Mar. 11, 1985, Ser. No. 710,692
Claims priority, application Belgium, Apr. 6, 1984, 2/60385
Int. Cl.[4] D03D *51/02*
U.S. Cl. 139—1 E **11 Claims**

1. A clutch device for a shot seeking mechanism for weaving

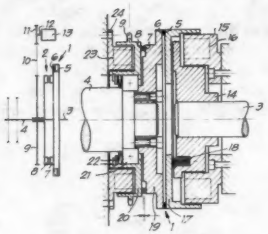
looms having a driven main shaft of the machine, a driving shaft and an auxiliary drive motor comprising:

(a) a first clutch support disc fixedly attached to the driven main shaft of the machine so as to rotate therewith and to be immovable in a direction along a longitudinal axis of the driven main shaft;

(b) first and second clutch means associated with the first, intermediate clutch support disc;

(c) a second clutch support disc attached to the driving shaft so as to rotate therewith and to translate in a direction along a longitudinal axis of the driving shaft;

(d) third clutch means located on the second clutch support disc;



(e) first operating means to move the second clutch support disc toward and away from the first clutch support disc so as to engage and disengage the first and third clutch means;

(f) a third clutch support disc drivingly connected to the auxiliary motor;

(g) fourth clutch means located on the third clutch support disc; and,

(h) second operating means to move the third clutch support disc toward and away from the first clutch support disc so as to engage and disengage the second and fourth clutch means.

4,592,393

WEFT THREAD PREPARATION DEVICE

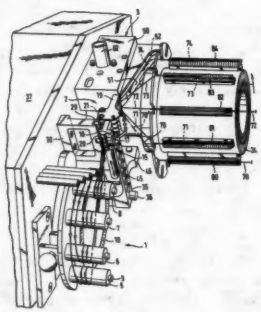
Alois Steiner, Rieden, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 27, 1984, Ser. No. 675,237

Claims priority, application European Pat. Off., Dec. 1, 1983, 83112065.4

Int. Cl.[4] D03D *41/00, 47/36*

U.S. Cl. 139—11 **6 Claims**



1. A weft thread preparation device for a superposed shed type weaving machine having a weaving rotor with a plurality of weft picking combs and beating-up combs, said device comprising

a weft measuring means for continuously measuring and conveying a plurality of weft threads;

a severing means having a plurality of shears for severing the respective weft threads, each shear having a blowing tube for receiving a weft-conveying air stream to pneumatically convey a weft thread therethrough and a cutting element for severing a weft thread extending from said blowing tube;

a weft insertion means having a guide duct extending from a selected one of said shears to the weaving rotor to guide a weft thread therethrough and a closure member on one side of said guide duct to retain a weft thread therein;

a first control means for selectively moving said shears in programmed sequence to position a blowing tube of a respective shear in alignment with said guide duct to convey a weft thread thereto;

a second control means for moving said closure member from said guide duct in response to insertion of a weft thread into a picking comb adjacent said guide duct to permit subsequent lateral movement of the weft thread from said guide duct; and

a third control means for selectively actuating said shears in programmed sequence to sever a weft thread therein in response to picking of the weft thread across a picking comb.

4,592,394

OPTICAL WEFT SENSOR FOR AIR JET WEAVING LOOMS

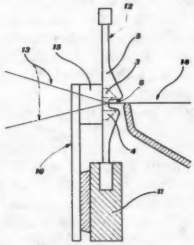
Paolo Bobbola, Vigliano Biellese, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy

Filed Oct. 10, 1984, Ser. No. 659,562

Claims priority, application Italy, Oct. 10, 1983, 23231 A/83

Int. Cl.[4] D03D *51/34*

U.S. Cl. 139—370.1 **1 Claim**



1. In combination with the loom reed of an air jet weaving loom, the reed having a plurality of adjacent blades each having a recess forming part of a loom reed channel through which a weft yarn passes, a casing outside the reed, two equally oriented parallel photoelements in the casing, and two very thin total-transmission optical prisms supported on the casing and extending outside the casing between two adjacent blades and disposed on opposite sides of said channel and so arranged as to guide light rays from one of said photoelements across said channel and then to the other of said photoelements.

4,592,395

PAPERMACHINE CLOTHING IN A FABRIC WEAVE HAVING NO AXIS OF SYMMETRY IN THE LENGTH DIRECTION

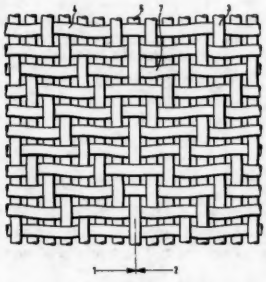
Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner - GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,968

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307144

Int. Cl.[4] D03D *15/00;* D21F *1/10*

U.S. Cl. 139—383 A 2 Claims



1. A papermachine clothing of interwoven longitudinal and transverse threads forming a fabric having a weave pattern which has no axis of symmetry in the length direction wherein the weave pattern of the two fabric halves separated by the longitudinal centerline of the papermachine clothing are mirror-symmetrical with respect to the longitudinal centerline and wherein along the line of contact of the two fabric halves one or more longitudinal threads are interwoven in such a way that on the running side of the fabric there are no floats of transverse threads which are substantially longer than the floats of transverse threads occurring in the fabric weave.

4,592,396

MULTI-LAYER CLOTHING FOR PAPERMAKING MACHINES

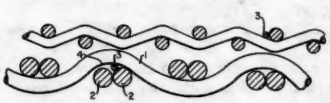
Georg Borel, Reutlingen, Fed. Rep. of Germany, and Bengt Jonsson, Upsala, Sweden, assignors to Hermann Wangner-GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,361

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329739

Int. Cl.[4] D03D *15/00;* D21F *1/10;* B01D *39/10*

U.S. Cl. 139—425 A 2 Claims



1. Paper forming fabric comprising: at least two fabric layers of interwoven structural longitudinal and transverse threads and additional transverse binder threads interconnecting said fabric layers; said fabric layers comprising an upper fabric layer and a lowermost fabric layer; the upper fabric layer being woven more finely than the lowermost fabric layer; the transverse binder threads (3) being thinner than the structural transverse threads (2) of the lowermost fabric layer; at least the structural transverse threads (2) of the lowermost fabric layer interwoven jointly with the transverse binder threads (3) being arranged as twin threads and enclosing the transverse threads (3) in the lowermost fabric layer between the corresponding twin structrual transverse threads (2) and the structural longitudinal thread (1) interwoven at the respective location; the binder threads (3) thereby being urged against the highest point (4) of the arc of the structural longitudinal threads (1) of the lowermost fabric layer without any particular tension being exerted thereon.

4,592,397

ARRANGEMENT FOR THE AUTOMATIC FILLING OF A CONTAINER

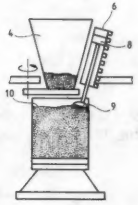
Horst Mitzner, Viersen, Fed. Rep. of Germany, assignor to Rheinische Maschinenfabrik & Eisengiesserei Anton Roper GmbH & Co. Kommanditgesellschaft, Dulken, Fed. Rep. of Germany

Filed Oct. 31, 1984, Ser. No. 666,881

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340266; Feb. 15, 1984, 3405419

Int. Cl.[4] B65B *1/04*

U.S. Cl. 141—18 11 Claims



1. In an arrangement for the automatic control of the filling of a measuring container with a pourable material from a supply container, in which a predetermined portion of the pourable material stored in the measuring container is withdrawn therefrom and a corresponding quantity of pourable material automatically refilled therein; the improvement comprising:

means for selecting a rated height of material in the measuring container;

displaceable means supported for movement along a path of travel adjacent the selecting means and extending into the measuring container for sensing the actual height of material in the measuring container; and

implementing means for for conducting and controlling the flow of material from the supply container into the measuring container and connected to the selecting means to add material to the measuring container for at least a portion of the time when the sensed level of material therein is below the rated material height.

4,592,398

CONTINUOUS TREE HARVESTOR

Theodore B. Golob, Ottawa; Wim Gilles, Gloucester; Stan K. Jasinski, and Patrick B. G. Whitehead, both of Woodstock, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 14, 1984, Ser. No. 681,652

Int. Cl.[4] A01G *23/08*

U.S. Cl. 144—3 D 10 Claims

1. A continuous tree harvestor comprising:

support means for attaching to a vehicle;

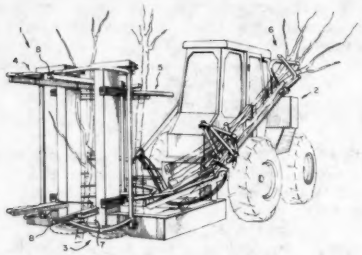
tree severing means;

a generally horizontal support surface and guide means spaced above the support surface for supporting severed upright trees;

feeding device for advancing the severed upright trees onto and along the support surface;

an accumulator, comprising inlet gate means and outlet

retaining gate means, for receiving trees advanced by the feeding means; and



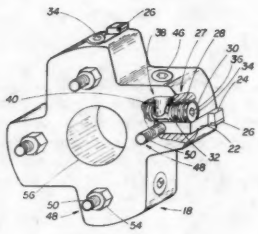
an unloading device for removing trees from the accumulator and unloading them from the harvestor.

4,592,399

ROTARY CUTTER ASSEMBLY

William J. Rhodes, 3347 Camp Ground Rd., Louisville, Ky. 40211

Filed Oct. 17, 1984, Ser. No. 661,778
Int. Cl.[4] B27G *13/00*
U.S. Cl. 144—229 **12 Claims**



1. A rotary cutting assembly comprising:
at least a first rotary cutter head;
at least one cutting tool associated with the cutter head at the perimeter thereof;
adjustment means interconnecting the at least one cutting tool and the first rotary cutting head for adjusting the distance by which the at least one cutting tool projects beyond the perimeter of the first cutter head without removing the at least one cutting tool from the first rotary cutter head; and
means for securing the at least one cutting tool against inadvertent movement with the cutting edge protruding a preselected distance beyond the perimeter of the first cutter head.

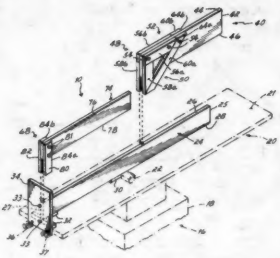
4,592,400

CLAMPING APPARATUS FOR A POWER JOINTER

John A. Graham, Rte. 2, Box 207, Cadiz, Ky. 42211

Filed Apr. 15, 1985, Ser. No. 723,562
Int. Cl.[4] B27C *1/12*
U.S. Cl. 144—253 E **10 Claims**

6. Apparatus for planing an end edge of a board with a power jointer having a bed and a rotatable cutting blade extending above the plane of the bed, comprising:
a support rail adapted to be supported atop the bed and cutting blade, said support rail having a top surface and a bottom surface facing the bed;
holder means mounted to said support rail and being movable with respect to the bed along said top surface of said support rail, and holder means having at least one clamping surface;
clamping means for mounting the board against said clamping surface so that an end edge of the board is disposed substantially parallel to and immediately above the plane of the bed;



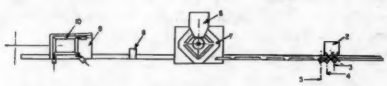
said holder means and the board being movable with respect to the bed along said support rail for passing the end edge of the board over the cutting blade to plane the end edge of the board.

4,592,401

METHOD FOR MITER JOINTING FRAMES AND APPARATUS FOR THE IMPLEMENTATION THEREOF

Joseph Vanago, 1, Rue des Chaux, Francheville Le Haut, France

Filed May 16, 1983, Ser. No. 499,165
Claims priority, application France, Sep. 16, 1981, 81 17609
Int. Cl.[4] B27D *1/00*; B27F *7/00*
U.S. Cl. 144—346 **16 Claims**



1. A method for miter jointing a frame which has a plurality of sides to be joined to form corners, said method comprising:
(a) cutting the sides of said frame;
(b) machining a corner part to be inserted into each of said corners to be joined, and machining said frame sides to have recessed portions;
(c) positioning said sides adjacent to each other so that recessed portions on respective sides will be positioned adjacent to each other to form a plurality of hollow corners;
(d) premounting said corner parts within said hollow corners;
(e) gluing said corner parts into said hollow corners; and
(f) jointing and thereafter tightening said frame, wherein said frame sides are cut to desired dimensions in step (a) by simultaneously cutting two sides, thereafter machining said frame sides to form said hollow corners.

2. Apparatus for jointing frames having corners, said apparatus comprising:
(a) a vertical pendular power saw having two circular blades angled at approximately 90° to each other and comprising means for miter cutting sides of said frames;
(b) a first template for positioning and retaining sides of said jointed frame in an assembled form;
(c) means for machining hollow corner portions in two adjacent frame sides and means for machining a plurality of corner parts;
(d) a station for gluing and pre-mounting said respective

corner parts into hollow corners formed between adjacent frame sides; and

(e) a movable template for mounting and framing sides of said frame.

4,592,402

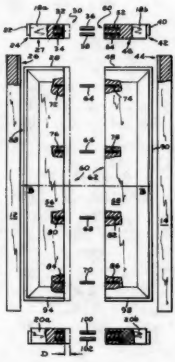
ADJUSTABLE MODULES

Charles J. Spofford, 59 Norwood St., Greenfield, Mass. 01301

Filed Oct. 24, 1983, Ser. No. 544,964

Int. Cl.[4] E04C *1/10*

U.S. Cl. 144—346 **4 Claims**



1. A method of building a final product of desired size from a set of adjustable modules, said method comprising:

(a) joining left-hand and right-hand, longitudinally extending modular sections at abutting, substantially squared, complemental ends by placing dowels into aligned channel halves in the complemental faces of the two sections, wherein the channel halves are each initially oversized to house more than one-half of its respective dowel;

(b) reducing the overall length of the module and the final product itself without destroying any functional aspects along the module's rim by trimming away the complemental ends prior to joining them together; and,

(c) attaching the module to another piece by a functional cooperation along their rims.

4,592,403

EMERGENCY OPERATION RING FOR TUBELESS TIRES IN MOTOR VEHICLES

Hermann Stein, Wuppertal-Barmen, and Ulrich Piepenbrink, Schwelm, both of Fed. Rep. of Germany, assignors to Vorwerk & Sohn GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 28, 1984, Ser. No. 645,098

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331143

Int. Cl.[4] B60C *17/06, 17/10*

U.S. Cl. 152—158 **8 Claims**

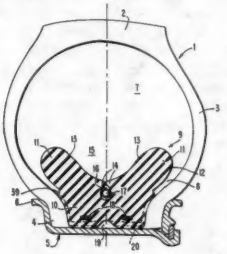
1. An emergency operation ring for incorporation in a tubeless tire having flank portions, beads and a tread cover, said tire being adapted to be mounted on a rim, said ring comprising:

(a) a base section adapted to be mounted on the rim, said base section extending fully between said beads and being laterally compressed when mounted;

(b) two support sections extending diagonally upward and outward from the base section, said support sections being curved at the tops thereof and defining a centrally positioned, groove-shaped circumferential channel, said support sections supporting the tread cover of said tire during loss of air;

(c) each support section including an outer flank spaced from the opposed flank of the tire to define therebetween a ring crevice, and centrally located sealing lip means at the bottom of said channel, said sealing lip means of said support sections when said tire is inflated being laterally biased by the compressive loading of said base section and defining therebetween annular groove means adapted to openly communicate with said channel when said tire loses air;

(d) a shoulder on each side of the base section which biases the support sections back toward the longitudinal center of the ring so as to further define said ring crevice;



(e) a slipping agent located in said groove means,

whereby said sealing lips are separated by lever action when the tread cover engages the support sections during loss of air so as to expose said groove means to said channel, thereby releasing said slipping agent and lubricating the surfaces of the emergency operation ring and the tire in contact therewith, said support sections during such lever action extending into said crevices.

4,592,404

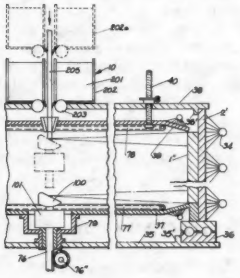
PROCESS AND APPARATUS FOR COMBINED STEEL MAKING AND SPRAY CASTING

Tadeusz Sendzimir, Weekeepeemee Rd., Woodbury, Conn. 06798

Continuation-in-part of Ser. No. 532,208, Sep. 14, 1983, Pat. No. 4,512,384. This application Mar. 7, 1985, Ser. No. 709,070

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—46 **5 Claims**



1. A process of converting a stream of desilicized and desulfurized pig iron into a single steel strip of unlimited length comprising the steps of injecting into said pig iron stream a pulverulent oxide chosen from the group consisting of mill scale, iron oxide, the oxide of an alkaline metal which completely evaporates at the temperature of the molten pig iron, the oxide of a desired alloying metal and combinations thereof, providing a heat absorbing target having a cylindrical target surface with a vertical axis, providing a projector axially of said target surface for projecting a stream of molten particles

against said target surface, providing a heat absorbing upper horizontal plane above said projecting means and a heat absorbing lower horizontal plane below said projecting means, said upper and lower planes cooperating with said target surface to form a chamber, maintaining a non-oxidizing atmosphere within said chamber, rapidly rotating and vertically oscillating said projector, causing said molten metal stream to flow vertically upon said projector, converting said molten stream by means of said projector into a stream of particles and projecting said stream of particles against said target to deposit on said target surface a layer of metallic particles substantially only one particle deep to insure that all the particles of said layer reach a crystallizing stage before the deposition of another layer thereon, similarly depositing subsequent layers until the strip product of required thicknesses is produced, providing said target surface with a diameter such that at least half of said particles are solid and plastic when they hit said target surface, rotating said target and said strip product formed thereon, and withdrawing said strip product therefrom as a single strip.

4,592,405

SQUEEZE CASTING OF ARTICLES

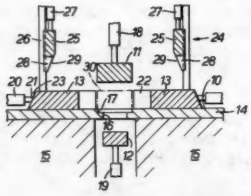
Gordon L. Allen, Rugby, England, assignor to AE PLC, Warwickshire, England

Filed Mar. 23, 1984, Ser. No. 592,860

Claims priority, application United Kingdom, Mar. 24, 1983, 8308174

Int. Cl.⁴ B22D *18/02*

U.S. Cl. 164—120 **10 Claims**



1. A squeeze casting press comprising a casting die including a top die part and at least one side die part movable into and out of engagement with other die parts to form the die, the press also including at least one wedge-shaped locking block which engages between a stop and an associated die part, when the die is formed, to prevent movement of the side die part when the top die part applies squeeze casting pressure, the wedge-shaped locking block having an inclined surface engaging with a co-operating inclined surface on the associated die part and being movable out of engagement with the associated side die part after squeeze casting has been performed to allow the side die part to be retracted from the die-forming position to permit the squeeze cast article to be removed.

4,592,406

APPARATUS FOR COMPACTING FOUNDRY SAND

Norbert Damm, Karlsdorf-Neuthard, Fed. Rep. of Germany, assignor to BMD Badisch Maschinenfabrik Durlach GmbH, Fed. Rep. of Germany

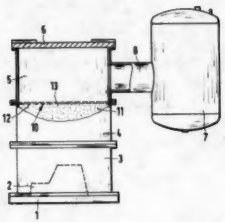
Filed May 3, 1984, Ser. No. 607,116

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317196

Int. Cl.⁴ B22C *15/00, 15/08*

U.S. Cl. 164—169 **13 Claims**

1. In an apparatus for the compaction of foundry sand by the impact of gas under pressure, said foundry sand being placed uncompacted in a flask over a pattern plate with a pattern, using a gas permeable diaphragm means placed directly over the surface of the uncompacted foundry sand and on which the gas under pressure is caused to act, the improvement wherein the diaphragm means has a permeability to gas that is so matched to the height of the foundry sand to be compacted



that said permeability is less where said pattern has a high contour than where said pattern plate is free of pattern.

4,592,407

FULL AUTOMATIC DIE CASTING MACHINE

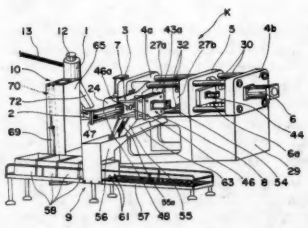
Terumoto Yamaguchi, Anjo, and Tuneo Terashima, Nagoya, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 492,993, May 9, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 783,054

Claims priority, application Japan, May 10, 1982, 57-77962

Int. Cl.⁴ B22D *17/00*

U.S. Cl. 164—265 **22 Claims**



20. An apparatus for finishing an article integrally formed with an engageable portion into a finished article by removing flash on said article and said engageable portion from said article, including a fixed die and a movable die such that said article is molded in a first cavity defined between said fixed die and said movable die, either one of said fixed die and said movable die being provided with a second cavity for forming said engageable portion integrally with said article, said apparatus comprising:

a trimming die which is formed with a first opening for fitting said article thereinto and a second opening for fitting said engageable portion thereinto such that said article and said engageable portion are acommodated in said first opening and said second opening, respectively;

a retainer member for fixedly retaining in said second opening said engageable portion, said retainer member being a spring biased pawl arranged to prevent the engageable portion from exiting the trimming die in the direction in which it is inserted;

a driving device for retractably driving said trimming die between said fixed die and said movable die at the time of opening of said fixed die and said movable die; and

a punching device which is pressed, when said trimming die is retracted away from between said fixed die and said movable die, against said article and engageable portion in said trimming die so as to remove said flash and said engageable portion from said article.

4,592,408

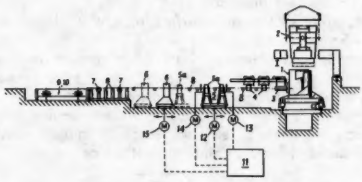
DEVICE FOR HORIZONTAL CONTINUOUS CASTING OF METALS AND ALLOYS

Manfred Haissig, 31 Foxhill, Irvine, Calif. 97214, assignor to Manfred Haissig, Irvine, Calif.

Continuation of Ser. No. 470,267, Feb. 28, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 788,662

Int. Cl.[4] B22D *11/128, 11/20*

U.S. Cl. 164—413 2 Claims



1. In apparatus for the horizontal continuous casting of metals or alloys, particularly steels, which includes a mold for forming a strand and a strand withdrawal device horizontally downstream of the mold, and wherein said withdrawal device comprises means for engaging said strand at a point along its path and moving said strand along said path, and said withdrawal device including means for establishing oscillatory movement of said strand along said path about said point of engagement, the improvement comprising menas for adjustably displacing said withdrawal device so as to selectively position said engaging means at a desired predetermined point of engagement along a given length of said strand path, and means for vertically adjusting the position of said engaging means in a direction perpendicular to said horizontal strand path so that said engaging means is aligned with the horizontal center line of said strand.

4,592,409

STRAND GUIDE FOR MULTI-STRAND METAL CASTING APPARATUS

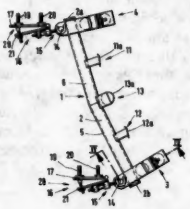
Robert Kaüfmann, Moers, and Wilhelm Kring, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 288,484, Jul. 30, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 582,131

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3029991

Int. Cl.[4] B22D *11/128*

U.S. Cl. 164—442 5 Claims



1. In a combination device which includes a strand guide and a multi-strand metal casting apparatus comprising:

(a) a single longitudinal girder comprising at least two individual girder sections joined, lengthwise, end-to-end, said longitudinal girder being supported by said metal casting apparatus;

(b) each of said girder sections being provided with at least one multi-strand support element for the individual cast metal strands;

(c) said support element having aligned individual strand vein support elements extending substantially perpendicularly to said girder sections;

(d) said single longitudinal girder being positioned below and lying between the outside ends of said multi-strand support element;

(e) outwardly projecting stems secured to at least one of said multi-strand support element;

(f) at least one bearing secured to said casting apparatus;

(g) said stems being supported in said bearings; and

(h) said bearings being variably adjustable both in horizontal and vertical directions, to thereby variably adjust the position of said longitudinal girder.

4,592,410

CONTINUOUS CASTING OF THIN SLABS

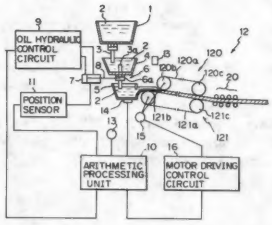
Tsutomu Takamoto, Minoo; Yasutake Ohhashi, Saga; Hisao Nishimura, Toyonaka; Yutaka Hirata, Saga; Takashi Okazaki, and Masahiro Yoshihara, both of Ibaragi, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Oct. 22, 1984, Ser. No. 663,561

Claims priority, application Japan, Oct. 28, 1983, 58-203250

Int. Cl.[4] B22D *11/20, 11/18, 11/16*

U.S. Cl. 164—453 6 Claims



1. A method of starting a continuous casting system of the type including a first, large-sized molten metal container; a second, small-sized molten metal container for holding a molten metal supplied from said first container up to a predetermined over-flow level, regulating means for regulating a supply of the molten metal from said first to said second container by adjusting a degree of opening of the regulating means, and casting means for continuously pulling and casting the molten metal over-flowing from said second container upon exceeding said predetermined level, said method comprising the steps of:

supplying molten metal to said first container;

adjusting said degree of opening of the regulating means to a predetermined degree, therby supplying the molten metal from the first to second container;

determining in at least two distinct time instants the weight of the molten metal contained in said second container subsequent to said step of adjusting and before an over-flow time at which the molten metal in said second container reaches said predetermined over-flow level;

calculating a rate of supply of the molten metal from the first to the second container subsequent to said step of adjusting and before said over-flow time on the basis of the weights determined in said step of determining the weight;

determining a relationship between said degree of opening of the regulating means and said rate of supply of the molten metal from the first to the second container on the basis of a relationship between said predetermined degree and the rate of supply of the molten metal calculated in said step of calculating the rate of supply of the molten metal;

calculating an opening degree value of the regulating means corresponding to a target supply rate of the molten metal from the first to the second container, on the basis of said relationship between the degree of the opening and the rate of supply of the molten metal;

readjusting said degree of opening of the regulating means to said opening degree value of the regulating means corresponding to the target supply rate calculated in said opening degree calculation step;

redetermining in at least two distinct time instants a weight of the molten metal contained in said second container after said step of readjusting and before said over-flow time;

recalculating a rate of supply of the molten metal from the first to the second container after said step of readjusting and before said over-flow time on the basis of the weights determined in said step of redetermining a weight;

calculating a start-up pulling rate and succeeding pulling rate of said casting means on the basis of the rate of supply of the molten metal from the first to the second container calculated in said step of recalculating the rate of supply of the moten metal;

detecting a begining of an over-flow of the molten metal from the second container upon reaching said predetermined level; and

pulling and casting the molten metal over-flowing from said second container at said start-up rate for a predetermined length of time, and then at a said succeeding pulling rate by said casting means.

4,592,411

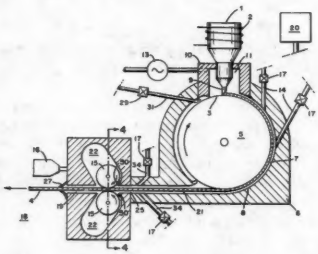
METHOD OF AND APPARATUS FOR CONTINUOUSLY CASTING METAL FILAMENT IN A VACUUM

John R. Bedell, Madison, and Howard H. Liebermann, Succasunna, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 458,250, Jan. 17, 1983, abandoned. This application May 3, 1984, Ser. No. 606,805

Int. Cl.[4] B22D *11/06, 11/10, 27/15*

U.S. Cl. 164—463 **8 Claims**



1. An apparatus for continuously casting a filament within a region of preselected vacuum and passing the filament to an ambient region of higher pressure, comprising:

(a) a rotating casting wheel having an annular, peripheral quench surface;

(b) a guide housing enclosing said casting wheel to separate said wheel from said ambient region and to delimit a guide region which is adapted to guide and pass said filament therethrough to a guide housing exit region communicating into said ambient region;

(c) an extrusion housing delimiting an extrusion chamber which communicates with said guide housing and has at least a portion of said quench surface disposed therein;

(d) an extrusion means located in said extrusion chamber for extruding molten metal onto said quench surface to form said filament;

(e) extrusion vacuum means for providing a preselected vacuum in said extrusion chamber;

(f) fluid jet means disposed in said guide housing for reducing the pressure therein and directing said filament through said guide region;

(g) passivator means for passivating said quench surface to inhibit welding of said filament to said quench surface; and

(h) airlock means located at said guide housing exit region for substantially preserving said vacuum in said extrusion chamber while continuously passing said filament to said ambient region.

5. A method for continuously casting a metal filament within a region of preselected vacuum, comprising the steps of:

(a) extruding molten alloy onto a moving quench surface of a rotating casting wheel located within said vacuum region to cast said filament;

(b) passivating said quench surface to inhibit adherence of said filament thereto;

(c) directing said filament with fluid jet means through a guide region and an exit passage which communicates with an ambient region of higher pressure; and

(d) substantially preserving the preselected vacuum in said vacuum region with airlock means as said filament is continuously passed to said ambient region.

4,592,412

METHOD OF PERIODICALLY HEATING A PRODUCT SEPARATOR OF A PLANT FOR PRODUCING PHTHALIC ANHYDRIDE OR MALEIC ANHYDRIDE

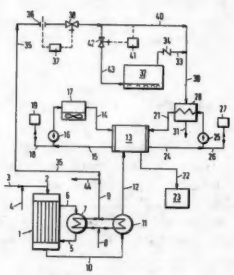
Volker Franz, and Rolf Geissen, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,915

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411732

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—2 **6 Claims**



1. In a method of periodically heating a product separator of a plant for producing phthalic anhydride (PA) or maleic anhydride (MA), wherein a liquid heat transfer medium is indirectly heated by means of steam in a heat exchanger and the liquid medium is circulated through the product separator to indirectly heat and melt the PA or MA product deposited on cooling surfaces, the improvement comprising obtaining most of the steam used to indirectly heat the liquid heat transfer medium from a steam accumulator at least during the time of the largest steam demand and charging the accumulator with steam supplied from the plant for producing PA or MA.

4,592,413

THROUGH-WALL TYPE AIR CONDITIONER

Kiyoshi Sugita, Warabi, and Hiroshi Nakanishi, Fujisawa, both of Japan, assignors to Matsushita Seiko Co., Ltd., Osaka and Kajima Corporation, Tokyo, both of, Japan

Filed Dec. 13, 1982, Ser. No. 449,226

Claims priority, application Japan, Dec. 14, 1981, 56-202174

Int. Cl.[4] F24F *7/00*

U.S. Cl. 165—59 **6 Claims**

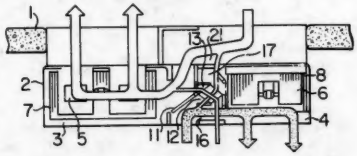
1. A through-wall type air conditioner for air conditioning of an indoor room, said air conditioner being capable of assum-

ing a first, second or third mode of operation, said first mode being for exhausting indoor room air to introduce outdoor air into the indoor room to recover waste heat therebetween while circulating indoor room air for air conditioning thereof, the second mode being for exhausting indoor room air and introducing outdoor air to thereby cool the indoor room without said circulation for air conditioning and the third mode being for preventing significant ventilation of the room through said air conditioner when the first and second mode air conditioning operations are halted, said air conditioner comprising:

a first blower compartment housing an air conditioning means, said first blower for producing airflow flowing into said indoor room;

a second blower compartment housing a second blower for producing airflow flowing outdoors;

a heat exchanger defining first and second air-flow paths which are combined in a heat exchanging relationship to recover waste heat therebetween;



an indoor room air exhausting path for exhausting indoor room air through said airflow path and said second blower compartment;

an outdoor air intake path for introducing outdoor air through said first airflow path and said first blower compartment;

damper means having first and second operational positions respectively for said first mode and for said second and third modes wherein in said first operational position said damper means (i) opens said indoor room air exhausting path to said second airflow path to allow exhaustion or room air, (ii) opens said outdoor air intake path to said first airflow path to allow introduction of outdoor air and (iii) enables circulation of indoor room air through said room air exhausting path and said first blower compartment, and wherein in said second operational position said damper means closes said outdoor air intake path and said room air exhausting path respectively to said first and second airflow paths to prevent respective significant ventilation caused therethrough.

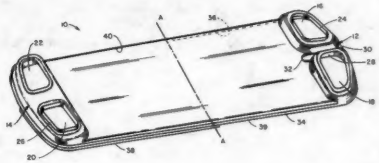
4,592,414

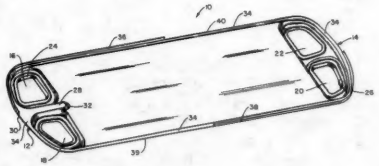
HEAT EXCHANGER CORE CONSTRUCTION UTILIZING A PLATE MEMBER ADAPTABLE FOR PRODUCING EITHER A SINGLE OR DOUBLE PASS FLOW ARRANGEMENT

Marvin D. Beasley, Mount Vernon, Ill., assignor to McCord Heat Transfer Corporation, Walled Lake, Mich.

Filed Mar. 6, 1985, Ser. No. 708,827
Int. Cl.[4] F28F *3/10*
U.S. Cl. 165—76 **21 Claims**

1. A plate member adaptable for use in a heat exchanger core assembly including a plurality of similarly constructed plate members mated together in pairs to form a central flow region between said mated plate members, each of said plate members comprising a generally planar member having oppositely facing surfaces associated therewith, said plate member having opposed side edge portions, opposed end portions and a header portion located respectively adjacent each of said opposed end portions, each of said header portions having at least one pair of spaced openings associated therewith, said header openings being positioned and arranged so as to be adaptable to register with corresponding header openings of a similarly constructed plate member when positioned adjacent thereto, a partitioning rib member located in one of the header portions associated with said plate member, said partitioning rib member being positioned extending longitudinally between tne pair of spaced openings associated with said respective header portion, a plurality of spaced flange tab portions extending outwardly away from one of said plate surfaces along the periphery thereof, a plurality of untabbed portions defined by the space between said plurality of flange tab portions along the periphery of said plate member, said tabbed and untabbed portions





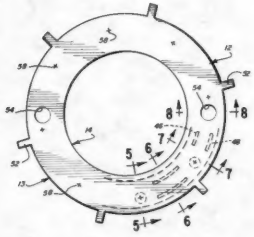
being positioned and arranged such that the spaced flange tab portions of one of said plate members cooperate with the untabbed portions of a similarly constructed plate member when said plate members are placed in mating face-to-face relationship with each other thereby forming a continuous side wall therearound regardless of which of said header portions are positioned adjacent each other when said pair of similarly constructed plate members are positioned in mating relationship with each other.

4,592,415

THIN FLAT HEAT EXCHANGER AND METHOD OF MAKING SAME

Howard Friedman, 9321 Menard, Morton Grove, Ill. 60053

Filed Oct. 9, 1984, Ser. No. 659,080
Int. Cl.[4] F28F *3/12*; H01L *23/40*
U.S. Cl. 165—80.5 **3 Claims**



1. A thin, flat heat exchanger of a thickness of no more than about one-eighth inch comprising a flat photochemically etched first thin, flat element having a first surface defining elevated first peripheral boundary portions surrounding a first etched-out recess,

a second thin, flat element confronting said first element and being sealingly secured to said first peripheral boundary portions to define a fluid passageway including said first etched-out recess,

first and second fluid openings defined by said elements and providing an inlet to, and an outlet from, said passageway, and

means integral with at least one of said elements and in contact with the other element located in said passageway for maintaining the skeletal stregth of said passageway and the structural integrity of said heat exchanger,

and wherein said second element is photochemically etched to provide a second surface defining elevated peripheral boundary portions surrounding a second etched-out recess, and wherein said first and second peripheral boundary portions are complementary to define a fluid passageway which includes said first and second etched-out recesses,

wherein said integral means includes complementary members projecting towards each other from each of said first and second thin flat members, and

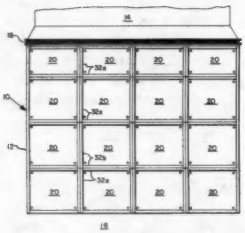
wherein said integral means further comprise post means defining a zone in which said heat exchanger may be drilled through without affecting the fluid tight integrity thereof, said post means being drilled to receive a fastener for securing said heat exchanger to an assembly to be cooled.

4,592,416

MODULAR TUBULAR HEAT EXCHANGER

Glenn D. Mattison, Wellsville, and Michael A. Case, Scio, both of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,115
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—83 **8 Claims**



1. A heat exchange apparatus comprising a plurality of heat exchange modules mounted together in side-by-side relationship between a gas inlet and a gas outlet to form a box-like array through which a heat exchange fluid passes in heat exchange relationship with the gas, each of said heat exchange modules comprising:

a. a rectangular box-like support frame formed of a pair of end frame members spaced apart and interconnected at their respective corners by longitudinally elongated support members, the support members interconnecting the lowermost corners of the end frames providing a track surface;

b. a tube bundle assembly disposed within said rectangular box-like support frame comprised of a pair of spaced tube sheets with aligned apertures therein and a plurality of longitudinally disposed heat exchange tubes extending between the aligned apertures in the spaced apart tube sheet providing a flow passage through which the heat exchange fluid may be passed in heat exchange relationship with the gas, said tube bundle assembly being translatable into and out of said support frame along the track surface provided by the support members interconnecting the lowermost corners of the end frames of said support frame; and

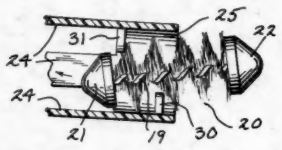
c. attachment means for mounting said tube bundle assembly to said support frame, said attachment means including expansion means for accommodating translational movement of at least one tube sheet of said tube bundle assembly within said support frame as the heat exchange tubes of said tube bundle assembly expand or contract longitudinally.

4,592,417

HEAT EXCHANGER TUBE CLEANING ELEMENT CAPTURING DEVICE WITH OFFSET STOP

Walter J. Baron, Mequon, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Dec. 5, 1984, Ser. No. 678,352
Int. Cl.[4] F28G *1/12*
U.S. Cl. 165—95 **7 Claims**



1. For use in a heat exchanger or the like having a housing containing a plurality of fluid flow tubes, a device comprising:

(a) a longitudinally extending elongated basket having an open outer end and with said basket adapted to capture a tube cleaning element propelled through a tube by fluid,

(b) and cleaning element retainer means integral with and disposed adjacent the said open outer end of said basket therewithin for preventing outward escape of a cleaning element from the basket during outward fluid flow through said basket,

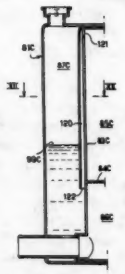
(c) said retainer means being adapted for insertion and removal of a cleaning element therethrough and comprising: longitudinally offset inner and outer projection means disposed in axially spaced generally transverse inner and outer planes and with said projection means being positioned so that a cleaning element can be manipulated therepast without substantially distorting said projection means.

4,592,418

DEGASSING DEVICE FOR A FLUID CIRCULATING IN A HEAT EXCHANGER

Patrick Cadars, Montigny le Bretonneux, France, assignor to Valeo, Paris, France

Division of Ser. No. 270,643, Jun. 4, 1981, abandoned. This application Mar. 6, 1984, Ser. No. 586,752
Claims priority, application France, Jun. 6, 1980, 80 12658
Int. Cl.[4] F01P *11/02*
U.S. Cl. 165—104.32 **3 Claims**



1. A degassing device for a cooling fluid circuit, comprising

a heat exchanger including a water box in which are defined a collecting chamber and a compensation chamber separated by a wall and communicating with each other via a lower passage and an upper passage, said upper passage extending substantially vertically along said wall from the upper portion of the collecting chamber and opening into the compensation chamber through a first port formed in said wall under the level of fluid present in said compensation chamber, said upper passage being a channel formed by molding into the thickness of said wall and communicating with the collecting chamber via a second port in said wall.

4,592,419

CONDENSER

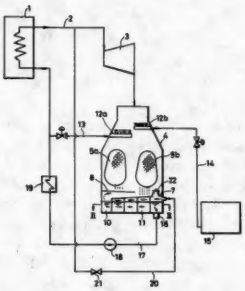
Keizo Ishida; Yoshikuni Ohshima; Toyoyuki Mukaidani; Isao Okouchi, all of Hitachi, and Kenkichi Izumi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,612

Claims priority, application Japan, Feb. 7, 1983, 58-17481

Int. Cl.[4] F28B *3/04*

U.S. Cl. 165—112 **2 Claims**



1. A condenser comprising:

a condenser body;

a cooling pipe nest provided in the upper part inside said condenser body for bringing said steam into contact therewith so that the steam is condensed into a condensate;

a hot well part provided in the lower part inside said condenser body and having a condensate passage including a condensate inlet, a condensate outlet, a flow section, and an oxygen gas containing steam section above said condensate passage;

a member extending substantially over a whole interior of said condenser body provided substantially horizontally between said cooling pipe nest and said hot well part for partitioning said cooling pipe nest and said hot well part from each other;

a plurality of partitioning members integrated with said horizontal partitioning member and provided vertically between the bottom surface of said condenser body and said substantially horizontally extending partitioning member so that a continuous meandering duct is formed by said condenser body, said substantially horizontally extending partitioning member, and said vertical partitioning member;

said flow section of said hot well part is formed within said continuous meandering duct so that the condensate said hot well part flows in a meandering fashion and horizontally in said condensate passage from the condensate inlet to the condensate outlet of said condensate passage;

said oxygen-gas containing steam section of said condensate passage is formed wholly continuously in a meandering fashion above said flow section; and

a scavenging means for expelling the oxygen-containing gas in said continuous meandering oxygen-gas containing steam section by steam which is introduced into said continuous meandering oxygen-gas containing steam section in a vicinity of the condensate outlet of said condensate passage and arranged to flow completely in said continuous meandering oxygen-gas containing steam section counter to the direction of flow of the condensate in said condensate passage of said hot well part.

4,592,420

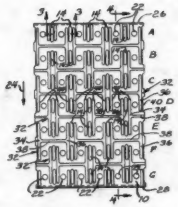
REINFORCED PLATE FIN HEAT EXCHANGER

Gregory G. Hughes, Milwaukee, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Jun. 27, 1985, Ser. No. 749,282

Int. Cl.[4] F28F *1/32*

U.S. Cl. 165—151 **9 Claims**



1. A plate fin heat exchanger comprising:

a plurality of generally parallel rows of tubes, each row having a plurality of said tubes in alignment with each other;

a stack comprised of a plurality of plate fins in generally parallel relation, each having tube holes shaped to receive said tubes in said row and said alignment, said tubes being disposed in said holes and extending through said stack; and

deformations in each of said plate fins, said deformation including pairs of first ridges flanking aligned tubes in at least two adjacent rows, and second ridges between said rows extending substantially between two of said first ridges.

4,592,421

SUCKER RODS

Jürgen Hoffmann, Cologne, and Lothar Preis, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 649,017

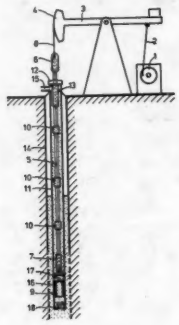
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335607

Int. Cl.[4] E21B *17/00*

U.S. Cl. 166—66 **9 Claims**

1. In a deep well sucker rod pump wherein a piston suspended from a system of sucker rods in a rising pipe is moved up and down in a pump casing at the bottom of the rising pipe by an above ground pump drive, the improvement wherein the sucker rod system comprises a plurality of unidirectionally

reinforced composite fiber rods each having a cross-sectional area of from 20 to 100 mm^2 and spacer means connected to the



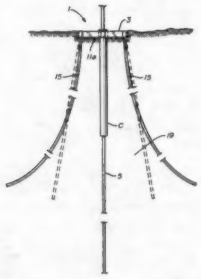
rods to maintain the rods substantially parallel to each other and not in contact with each other.

4,592,422

CASING HANGER APPARATUS AND METHOD OF INSTALLATION THEREFOR

James Hipp, New Iberia, La., assignor to Petro-Drive, Inc., Lafayette, La.

Continuation of Ser. No. 364,526, Apr. 1, 1982, Pat. No. 4,469,182. This application Jun. 20, 1984, Ser. No. 622,750
Int. Cl.[4] E21B *33/03*
U.S. Cl. 166—96 **6 Claims**



1. The combination of a hole drilled into the earth for the retrieval of hydrocarbon product therethrough having a casing-liner disposed therein for maintaining the integrity of the walls of the hole while conducting retrieval operations therein, the improvement comprising:

(a) a casing hanger apparatus means disposed above the hole and adapted to carry the casing-liner whose weight is to be borne by the casing hanger apparatus means while it hangs therefrom downwardly into the hole, thus enabling expansion of the casing-liner without deterioration of its supported status in the hole, said casing hanger apparatus means preventing any movement of the upper portion of the casing-liner relative to the hole;

(b) pile holding means affixed to said casing hanger apparatus means;

(c) pile means for pinning said pile holding means to earth thereabout to thus lock the casing hanger apparatus means in fixed position above the hole while said casing-liner hangs thereform; and

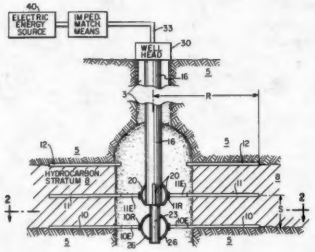
(d) means for holding the casing-liner independently of said casing hanger apparatus means while sequential lengths of the casing line are affixed thereto in preparation for hanging the casing lining in the hole from the casing hanger apparatus means.

4,592,423

HYDROCARBON STRATUM RETORTING MEANS AND METHOD

Kerry D. Savage, and Hans J. Paap, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 14, 1984, Ser. No. 610,072
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—248 **19 Claims**



1. A system for in-situ retorting of a hydrocarbon stratum, having a borehole traversing it, with RF energy comprising:

source means for providing RF energy;

means connected to said source means and having an outer conductor and an inner conductor for conducting the RF energy from the source means downhole;

a first plurality of electrodes, inserted into said hydrocarbon stratum and arranged in a radial pattern;

first connecting means for commonly connecting the first plurality of electrodes;

a second plurality of electrodes inserted into said hydrocarbon stratum, spatially related to said first plurality of electrodes in a predetermined manner, and arranged in a radial pattern;

second connecting means for commonly connecting the second plurality of electrodes;

first contact means, affixed to the outer conductor of the conducting means and adapted to pass through any connecting means, for making electrical contact between the outer conductor of the conducting means and the first connecting means; and

second contact means, affixed to the inner conductor of the conducting means and adapted to pass through any connecting means, for making electrical contact between the inner conductor of the conducting means and the second connecting means so that the rf energy is applied across that portion of the hydrocarbon stratum between the two pluralities of electrodes.

16. A method for the in-situ retorting of a hydrocarbon stratum, having a borehole traversing it, with rf energy comprising the steps of:

providing rf energy, conducting the rf energy down the borehole; and applying the rf energy in the borehole to two pluralities of electrodes, each plurality of electrodes being arranged in a radial pattern and spatially related to each other such that one plurality of electrodes is separated from the other plurality of electrodes by a distance S which is substantially smaller than a distance R from the center line of the borehole to the end of an electrode furthermost from the center line of the borehole which are inserted into the hydrocarbon stratum so that the rf energy is applied across that portion of the hydrocarbon stratum between the two pluralities of electrodes.

4,592,424
SECONDARY RECOVERY PROCEDURE

Stephen L. Long, and Alfred Brown, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 13, 1984, Ser. No. 639,657
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—263 **16 Claims**

1. In a secondary recovery procedure employing an injection well wherein fluid is injected and said injection has stopped long enough to cause back flow from the formation back into the well, a method of freeing said formation adjacent to said well from heavy paraffinic-aromatic residue, comprising the steps of

introducing a quantity of solvent for said residue into said well at said formation,

holding said quantity of solvent at said formation for a predetermined length of time,

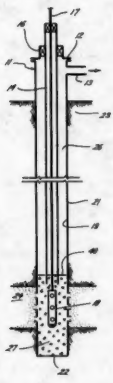
introducing another quantity of said solvent into said well, and

immediately beginning injection of said injection well fluid as prior to said back flow.

4,592,425
PROCESS TO REMOVE SETTLED SOLIDS FROM COMPLETION BRINES

Oliver, Jr. John E., and Arnold M. Singer, both c/o Clear Fluids, Inc., P.O. Box 275526, Houston, Tex. 27526

Continuation-in-part of Ser. No. 310,653, Oct. 13, 1981, Pat. No. 4,456,537, and a continuation-in-part of Ser. No. 450,519, Dec. 17, 1982, Pat. No. 4,515,699, and a continuation-in-part of Ser. No. 460,173, Jan. 24, 1983, Pat. No. 4,474,240, and a continuation-in-part of Ser. No. 521,187, Aug. 8, 1983, Pat. No. 4,528,102. This application Oct. 29, 1984, Ser. No. 665,555
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—312 **9 Claims**



1. In a well system containing an almost solids-free completion and completion and packer brine, the situation where settled solids (filtered or unfiltered) settle to the bottom of the brine in the well bore and such settled solids interfere with completion operations, the improvement process comprising:

(a) spotting in the settled solids a chemical aid consisting essentially of an aliphatic alcohol with between 5 and 14 carbon atoms and a surfactant with a molecular weight in a range from about 150 to 500 with predominately hydrophobic characteristics, and the surfactant is selected from the group consisting of aliphatic amines, amides and aliphatic amine oxides with an alkyl group between 8 and 18 carbon atoms used in a selected volume and concentration relating to the amount and type of solids whereby these solids are made buoyant in the brine;

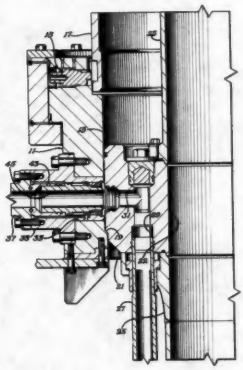
(b) allowing the buoyant solids to rise to the top of the well bore; and

(c) practicing the completion operations at the bottom of the well bore in solids-free brine.

4,592,426
UPPER TERMINATION WITH SLIDING SLEEVE SEALS

Stephen A. Neely, Long Beach, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 10, 1984, Ser. No. 679,787
Int. Cl.[4] E21B *23/04, 41/04, 43/01*
U.S. Cl. 166—347 **3 Claims**



1. In a fluid connection system for a subsea well having a termination head connected to a riser string, a termination housing having hose means connected to a floating vessel and a bore which releasably receives the termination head, the termination head and termination housing having passages transverse to the axis of the riser string that register with each other to transmit fluids through the hose means between the floating vessel and riser string, the improvement comprising in combination:

a sleeve having an axis and reciprocally carried in the termination housing passage, the sleeve having a bore therethrough, the sleeve having a forward end adapted to be received within the termination head passage;

seal means for sealing the exterior of the forward end of the sleeve to the interior of the termination head passage; and

hydraulic means for moving the sleeve along its axis between an open position removed from the termination head passage to a closed position with its forward end sealingly located within the termination head passage, for the passage of fluid through the bore of the sleeve between the termination head and termination housing.

4,592,427
THROUGH TUBING PROGRESSING CAVITY PUMP

Arvid E. Morgan, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 19, 1984, Ser. No. 622,330
Int. Cl.[4] E21B *43/00;* F04C *1/06*
U.S. Cl. 166—369 **4 Claims**

3. A method of installing a progressing cavity pump assembly within a well, the pump assembly being of the type having a stator, a helical rotor located in the stator and rotated by a string of sucker rods extending through tubing to the surface, comprising:

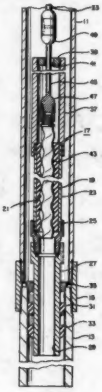
securing a tubular seating member to a lower end of the tubing and lowering the tubing into the well;

mounting a seating member on a lower end of the pump assembly;

mounting a rotor nipple to the upper end of the stator and a drive rod to the upper end of the rotor, and providing the rotor nipple and drive rod with engaging means that allows a selected amount of vertical movement of the rotor with respect to the stator;

connecting the upper end of the drive rod to the sucker rods;

lowering the pump assembly into the tubing on the sucker rods until the seating member on the pump assembly contacts the tubular seating member;



continuing to lower the sucker rods without rotation, moving the rotor downward with respect to the stator and forcing the seating members together with the weight of the sucker rods applied to the stator through the engaging means; then

moving the sucker rods and the rotor a selected distance upward while the stator remains stationary to position the top of the rotor above the stator a selected distance; then

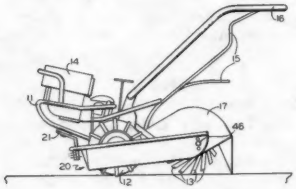
connecting the sucker rods at the surface to a rotary power source and rotating the sucker rods to cause the pump to operate.

4,592,428

PLANT PROTECTIVE APPARATUS

Everest G. Whitney, P.O. Box 141, Depot St., Burke, N.Y. 12917

Filed Oct. 7, 1983, Ser. No. 540,162
Int. Cl.[4] A01B *39/26*
U.S. Cl. 172—81 **11 Claims**



1. Apparatus for protecting plants from damage from the operation of agricultural or gardening type earth working machines having a frame member supporting motor means and control means in spaced relation to the ground, and earth working members having a housing disposed thereabout and drive members in mutually spaced ground engaging relation, said apparatus comprising:

a fender member partially surrounding said earth working members and said drive members;

means for attaching a first end of said fender member to said frame member proximately said drive members;

means for attaching a second end of said fender member to said housing;

and wherein

said means for attaching said first and second ends of said fender member support said fender member in a fixed spaced relation to said frame member;

said means for attaching one of said ends includes means for selecting the distance of said fixed spaced relation;

said means for attaching the other of said ends is means for pivotably attaching; and

wherein said fender member more particularly comprises:

a rigid support member;

a bracket member for attaching said support member to said frame member;

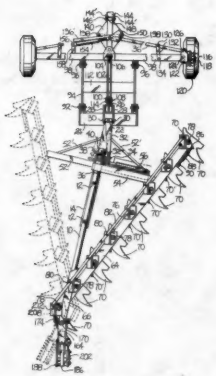
first and second guard members attached to said support member at a first end of each said guard member and having means for attaching a second end of each of said guard members to said housing.

4,592,429

ROLL-OVER VARIABLE WIDTH PLOW

Glen A. Watts, Rte. 3, Box 120, McMinnville, Oreg. 97128

Filed Jan. 23, 1984, Ser. No. 573,293
Int. Cl.[4] A01B *3/30, 69/08*
U.S. Cl. 172—212 **8 Claims**



1. A two-way gang plow comprising:

(a) an elongated main frame,

(b) an elongated plow bottom support frame supported adjacent its rear end by the main frame adjacent the rear end of the latter for rotation about the longitudinal axis of the main frame, the plow bottom support frame extending forwardly from said rear end support at an acute included angle relative to the main frame,

(c) a plurality of pairs of plow bottoms mounted on the plow bottom support frame, each plow bottom having a land side,

(d) a roll-over frame member secured at one end to the plow bottom support frame and supported adjacent its opposite end for rotation about the longitudinal axis of the main frame adjacent the front end of the latter,

(e) and elongated front axle secured pivotally to the front end of the main frame midway between its ends and extending transversely of the main frame for pivotal movement about a vertical axis,

(f) front steerable support wheels mounted on the opposite ends of the front axle for pivotal steering movement about vertical axes,

(g) steering plate means connected at its rear end to the front axle midway between the ends thereof for pivotal movement about a vertical axis and arranged at its front end for connection to a towing tractor,

(h) linkage means interconnecting the steering plate means and each front support wheel for moving the support wheels in steering directions by pivotal movement of the steering plate means,

(i) an hydraulic master cylinder pivotally interconecting the steering plate means and the front axle for extension and retraction as the steering plate means is pivoted,

(j) a tail wheel support member operatively connected pivotally at its forward end to the rear end of the main frame for pivotal movement about a vertical axis, and

(k) an hydraulic slave cylinder pivotally interconnecting the tail wheel support member and the main frame, the slave cylinder and master cylinder being coupled together for movement of one of said cylinders in response to movement of the other cylinder for pivotally rotating the front steering wheels and tail wheel in opposite steering directions.

4,592,430

FLUID-PRESSURE OPERATED TOOLS

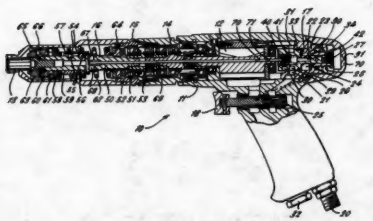
Raymond J. Hall, and Ian S. Burton, both of Buckinghamshire, England, assignors to Compair Power Tools Limited, Buckinghamshire, England

Filed Nov. 30, 1983, Ser. No. 556,380

Claims priority, application United Kingdom, Dec. 3, 1982, 8234562; Jul. 28, 1983, 8320382

Int. Cl.[4] B23P *19/00*

U.S. Cl. 173—12 **15 Claims**



1. A fluid-pressure operated tool for anchoring threaded fasteners, comprising a housing having a reversible fluid pressure operated rotary motor having a rotational axis, a bit holder, means rotating about said axis for delivering drive from the motor to the bit holder which means includes a clutch between the motor and the bit holder which is arranged to slip at a predetermined torque corresponding to the torque required to anchor a threaded fastener in position, said clutch having one part which moves axially relative to the housing when the clutch slips, first valve means movable between a first position allowing pressure fluid to be supplied to the motor to cause rotation thereof in a forward direction, and a second position allowing pressure fluid to be supplied to the motor to cause rotation thereof in the reverse direction, said first valve means moving between said first position and said second position on a line parallel to the rotational axis of the rotary motor, a chamber defined between said first valve means and said housing, the first valve means being held in its first position by fluid pressure in said chamber, a second valve means which is normally in a closed position but which is movable to an open position to vent said chamber and relieve said fluid pressure therein to allow the first valve means to move to its second position, said second valve means moving between said closed position and said open position on a line parallel to the rotational axis of the rotary motor, and actuating means arranged between the one part of the clutch and the second valve means, the actuating means being positively displaced by movement of said one part of the clutch when the clutch slips at the predetermined torque to open the second valve means so that the first valve means moves to its second position causing the motor and the bit holder to rotate in the reverse direction to allow withdrawal of the tool from the anchored fastener.

4,592,431

DEVICE FOR DEPOSITION OF THE MOVEMENTS OF TWO DRIVEN BODIES IN THE FORWARD DIRECTION OF A TOOL

Peter J. T. Tornqvist, Barkassvagen 11, 181 35 Lidingo, Sweden

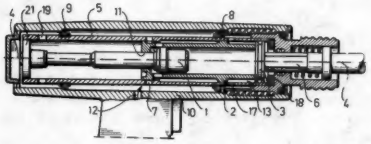
Continuation of PCT SE 83/00470 Filed Dec. 22, 1983, published as WO 84/02488 on Jul. 5, 1984.

This application Aug. 22, 1984, Ser. No. 643,802

Claims priority, application Sweden, Dec. 22, 1982, 82073511

Int. Cl.[4] B25D *17/24*

U.S. Cl. 173—103 **7 Claims**



1. A device for depositing or impacting reciprocating movements of two pistons driven by a medium under constant pressure and applied between the two pistons, in the forward direction of a tool, comprising:

a cowl having a first opening for receiving a pressurized drive medium;

a cylindrical casing having a center axis, said casing being sealed in a bore in said cowl to define a first drive medium space between the outside of said casing and the inside wall of said cowl having said first opening, said casing having a second opening for admitting the drive medium to the interior of said casing;

a first piston and a second piston both arranged in the interior of said casing coaxially with said center axis;

said first piston having a first end part which runs outside the path of movement of said second piston and is sealed against the interior wall of said casing, a second end part of the first piston is arranged to move in sealing relation within a bore in the second piston, and an intermediate rod which connects said first end part and said second end part to one another;

said second piston being sealed against the interior wall of said casing and defining a second drive medium space between the outer circumference of said second piston and the interior wall of said casing having said second opening, said second piston having a third opening in its circumferential surface for admitting the drive medium within the bore of said second piston;

an end wall on said second piston having a seal opening coaxial with said center axis, said seal opening receiving said rod of said first piston;

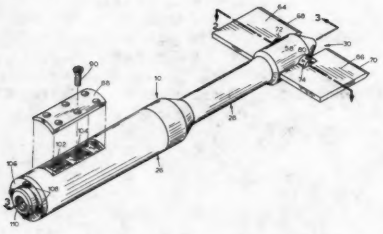
wherein the cross-section along a first section of said rod which connects directly to said first end part is less than the cross-section of said seal opening so that pressurized drive medium inside said second piston can pass through said seal opening and move against said first end part of said first piston to move said first piston backwardly away from said second piston, and the cross-section of a second section of said rod which connects directly to said second end part of said first piston is dimensioned to run in sealing relation with said seal opening so that the pressurized drive medium can move against said second end part to move said first piston forwardly into said second piston until the first section of said rod is present at said seal opening.

4,592,432

AUTOMATICALLY OPERATED BORING HEAD

Russell R. Williams, R.R. #1, and Clyde W. Lestage, R.R. #1, Box 65A, both of Danville, Iowa 52623

Filed Jun. 3, 1985, Ser. No. 740,434
Int. Cl.[4] E21B *7/04, 7/26*
U.S. Cl. 175—26 **10 Claims**



1. A boring head assembly for automatically maintaining a horizontal plane while forming a hole for a pipe installation through the subsoil beneath a roadway and the like, comprising:

an elongated cylindrical housing having a leading and trailing end adapted to be pushed or driven through the subsoil,

a boring head removably secured to said leading end,

a shaft disposed through said boring head transversely of the longitudinal axis of said housing,

a pair of canard stabilizers disposed respectively at opposite sides of said boring head and each secured to a respective end of said shaft,

rocker means in said boring head for effecting limited movement of said shaft in respective opposite directions about its longitudinal axis,

electrically operably means in said housing operatively connected to said rocker means whereby movement of said rocker means correspondingly moves said canard stabilizers to and away from a horizontal plane,

a battery operated switch controlled electronic circuit in said housing, comprising:

a relay operably connected to said electrically operable means,

means for sensing the horizontal position and any deviations therefrom of said housing and for transmitting signals relative thereto,

means for receiving and amplifying said signals, and

means for receiving said amplified signals and converting the same in degrees up and down into digital signals and transmitting the same to said relay for effecting selective upwardly and downwardly movement of said canard stabilizers.

4,592,433

CUTTING BLANK WITH DIAMOND STRIPS IN GROOVES

Mahlon D. Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

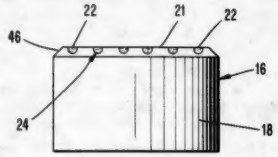
Filed Oct. 4, 1984, Ser. No. 657,535
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **20 Claims**

1. A cutting blank comprising:

a substrate formed of cemented carbide and including a cutting surface,

a plurality of shallow grooves formed in said cutting surface and each including opposing side and base portions formed of said cemented carbide, and

strips of a diamond substance disposed in respective ones of said grooves and adhered to said side and base portions and extending to said cutting surface of said substrate to



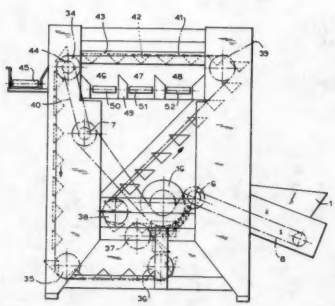
define an exposed cutting face lying substantially flush with said cutting face.

4,592,434

MACHINES FOR WEIGHING AND SELECTING MARKET GARDEN PRODUCE AND THE LIKE

Miguel A. Perez Galan, Camino Albalat,s/n., Alcira (Valencia), Spain

Filed May 16, 1984, Ser. No. 610,876
Claims priority, application Spain, May 17, 1983, 522463
Int. Cl.[4] G01G *13/00, 13/02, 19/00, 19/22*
U.S. Cl. 177—25 **6 Claims**



1. In a machine for transporting, weighing and selecting market garden produce and the like, comprising an assembly of operating units which, in combination and synchronized together, form a weighing and selecting machine for fruit in general which includes a feed unit equipped with rollers which are given rotary motion and which are arranged to form a series of moving channels for feeding produce one item at a time, a container train with a plurality of containers thereon, a static weighting unit which constitutes a means of continuous and cyclical conveyance at constant speed, with removal of the fruit a piece at a time, and a transfer of the same in any direction, horizontal, vertical or inclined, while at the same time keeping horizontal each container carrying the unit of produce, temporary storage units arranged successively and transversely in the direction of forward movement of the container train on a horizontal plane situated parallel to that on which the fruit is unloaded by gravity, a base of the unit being formed by a means of horizontal conveyance which stays at rest until a predetermined weight is reached, at which point it may be set in motion to remove a collection of fruit to another machine for subsequent processing, or continue to transport it to the point of removal of fruit rejected because of insufficient weight, the improvement comprising the container train being formed by a series of transverse support shafts on two endless chains, so as to cause the train to travel in a closed circuit cycle, with the shafts moving ahead perpendicularly, although the movement in question may also be horizontal, vertical or inclined, said shafts, in their movement, draw the containers mounted on them, all of the containers having their center

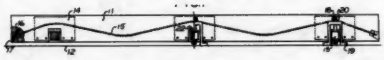
section traversed by an opening, inside which an axle is positioned which allows each container to be rotated and turned freely during its displacement and forward movement, each container having a series of prongs parallel to one another and each being of concave-convex shape, and all closed at the sides by two walls parallel to each other, each container being enclosed at the sides by a wall assembly, a unit for the removal of fruit of insufficient weight, and a programmable processor which automatically adjusts for the tare weight in the weighing unit, determines the average weight of the fruits and sets up combinations of the unit weights of each item of fruit, so as to coordinate the selective unloading of the same at the place predetermined in advance and memorized in the programme, while generally coordinating and controlling the operation of the machine by means of conventional handling and control devices and components.

4,592,435

MONOLITHICALLY CAST CONCRETE WEIGHBRIDGE

Michael J. Karpa, 45 East Bend Ave., N., Hamilton, Ontario, Canada (L8L 7E1)

Filed Dec. 11, 1984, Ser. No. 680,306
Int. Cl.[4] G01G *19/02, 21/22*
U.S. Cl. 177—132 **7 Claims**



1. A vehicle weighing device comprising:

(a) an elongated prestressed monolithic concrete slab containing a plurality of internal lateral supports,

(b) each of said lateral supports comprised of a pair of substantially vertically arranged end plates having a plurality of crossbars positioned contiguous to the lower portion of said end plates supplying tension, the upper portions of said end plates having a zone of compressed concrete therebetween,

(c) a plurality of stressing cables arranged longitudinally within the slab, said cables positioned near the top of said slab in areas of negative moment and near the bottom of said slab in areas of positive moment,

(d) a plurality of load cells operatively connected to the ends of said lateral supports, and

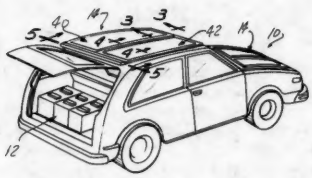
(e) means to sum the readings from each load cell to determine the weight on the slab.

4,592,436

SOLAR POWERED VEHICLE

Edmardo J. Tomei, 1155 Riviera Dr., Flint, Mich. 48507

Filed Aug. 19, 1982, Ser. No. 409,420
Int. Cl.[4] B60L *9/00*
U.S. Cl. 180—2.2 **4 Claims**



1. A solar powered vehicle comprising:

an electric motor for propelling the vehicle;

a plurality of electric storage batteries mounted within the vehicle for providing electrical power to the electric motor; and

solar panel means mounted on the exterior of the vehicle and electrically connected to the storage batteries for converting incident solar radiation into electricity for charging the batteries;

the solar panel means comprising a lower panel mounted on the vehicle and at least a first upper panel pivotally mounted on a side of the lower panel and movable between a first inboard position overlaying the lower panel and a second outboard position in-line with the lower panel in which the lower panel and the first upper panel are disposed for receiving incident solar radiation, and

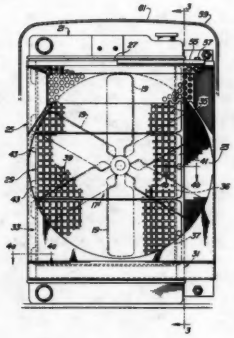
releasable interlocking means, mounted on the lower panel and the first upper panel, for releasably interconnecting the lower panel and the first upper panel in a secure, spacedapart position when the first upper panel is disposed in a first inboard position overlaying the lower panel.

4,592,437

RADIATOR SAND SCREEN MOUNTING ARRANGEMENT

David R. Holm, and Carl A. Wubben, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 25, 1985, Ser. No. 695,147
Int. Cl.[4] B60K *11/04*
U.S. Cl. 180—68.6 **7 Claims**



1. A radiator sand screen for mounting in a vehicle having an engine compartment housing an engine driving a fan, a radiator located opposite said fan and a shroud extending between said fan and said radiator, comprising:

a sand screen including a plurality of screen members, each of said screen members being generally rectangular shaped of generally uniform thickness, and having a core forming a plurality of open cells, each cell having a flow passage of decreasing cross-sectional area in the direction of the radiator and being oriented relative to said radiator such that air driven by said fan is directed through said open cells of said screen members to journey perpendicularly through said radiator;

a first mounting rail fixably mounted vertically along one vertical side of said radiator;

a second mounting rail fixably mounted vertically along the other vertical side of said radiator;

first means for fixably and detachably mounting said screen members in vertically stacked relationship to said rails between said radiator and said fan in adjacent relationship to said radiator and spaced apart relationshion to said fan, said screen members having a generally horizontal extension; and

second means for providing access to said screen members through said engine compartment and said shroud.

4,592,438

MOUNTING FOR POWER-ASSISTED MASTER BRAKE CYLINDER IN AN AUTOMOTIVE VEHICLE

Norbert Spielmann; Udo Güssbacher, both of Ebern; Wolfgang Walter, Schorkendorf; Hermann Bauer, Lülsfeld, and Rainer Porzel, Ebern, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schafer & Co., Schweinfurt, Fed. Rep. of Germany

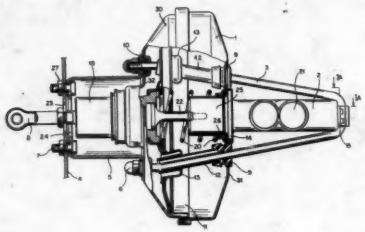
Filed Feb. 1, 1983, Ser. No. 463,048

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203495

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] B62D *23/00*; B60T *13/00*

U.S. Cl. 180—89.1 12 Claims



1. In an automotive vehicle having an engine compartment separated by a dashboard from the interior of the vehicle, a power cylinder on the engine side of the dashboard having an actuator which traverses said dashboard and is linked with a brake pedal on a driver's side thereof, and a master brake cylinder of lesser diameter coaxially adjoining said power cylinder in the engine compartment,

the combination therewith of a generally stirrup-shaped retainer in said engine compartment with a bight embracing a free end of said master brake cylinder remote from said power cylinder and with a pair of legs traversing said power cylinder, said legs extending parallel to said master brake cylinder while flanking same and being detachably anchored to said dashboard under tension for holding said cylinders in position.

4,592,439

MULTI-PURPOSE, ALL TERRAIN VEHICLE

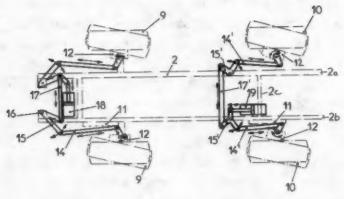
Andre Collard, Rue de Tours, and Michel Collard, Lotissement "Les Tartelettes", both of Bouzy, Marne, France

Filed Mar. 2, 1984, Ser. No. 585,573

Claims priority, application France, Mar. 4, 1983, 83 03970

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—140 4 Claims



1. A multi-purpose, all terrain vehicle comprising:

a chassis comprised of a left side longitudinal member and a right side longitudinal member, each said right side and said left side longitudinal member having a first end connected to a front chassis member and having a second end connected to a rear chassis member;

a plurality of individual wheels comprising a left front wheel mounted to said front chassis member, a right front wheel mounted to said front chassis member, a right rear wheel mounted to said rear chassis member, and a left rear wheel mounted on said rear chassis member;

a first steering means for steering said right front and said left front wheels together;

a second steering means for steering said right rear and said left rear wheels together, said second steering means being independent of said first steering means; and

means located at each of said individual wheels for independently adjusting the height of said chassis at the location of each said individual wheel, wherein;

one of said first steering means and said second steering means comprises:

a hydraulic piston cylinder mounted to said chassis;

a first link member pivotably attached to said chassis at a pivot point in said first link member, said first link member having a first arm, a second arm, and a third arm extending from said pivot point, said first arm attached to and driven by said hydraulic piston cylinder;

a steering rod having a first end and a second end, said first end being attached to said second arm of said first link member;

a first connecting link connecting said third arm to one of said individual wheels;

a second link member pivotally attached to said chassis at a pivot point in said second link member, said second link member further having a fourth arm and a fifth arm, said fourth arm being attached to said second end of said steering rod; and

a second connecting link connecting said fifth arm to another of said individual wheels.

4,592,440

POWER STEERING APPARATUS

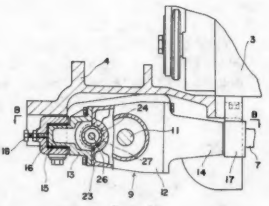
Tsuginobu Ujita, and Seiichi Takahashi, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jul. 11, 1984, Ser. No. 629,925

Claims priority, application Japan, Jul. 28, 1983, 58-118138[U]

Int. Cl.[4] A63C *5/08*

U.S. Cl. 180—155 5 Claims



1. A front wheel power steering apparatus for a front wheel drive vehicle having a body and steering wheels comprising:

a front wheel support assembly extending transversely of said vehicle body and supported by said vehicle body for pivotal movement about a longitudinal axis,

said front wheel support assembly including a front axle case having a front and a rear side,

a front wheel axle housed in said front axle case,

a drive shaft supporting case attached to the rear side of said front axle case and pivotally supported by said vehicle body,

a lid detachably attached to said front side of said front axle case,

said lid includes a center pin extending forwardly thereof which is rotatably supported by said vehicle body,

a steering cylinder supported on said front wheel support assembly between said front axle case and said lid so as to oscillate with said front axle case,

steering arms respectively associated with said steering wheels for steering said steering wheels, and

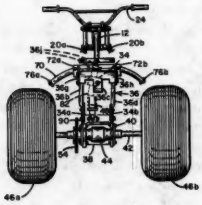
tie rod means operatively connected between said steering arms and said steering cylinder for operating said steering arms to steer said steering wheels.

4,592,441

THREE-WHEELED MOTOR VEHICLE WITH PIVOTABLE FRAME

Gregory J. Marier, Brooklyn Park, and Wayne L. Warnke, Wayzata, both of Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 20, 1984, Ser. No. 622,754
Int. Cl.[4] B62K *5/06*
U.S. Cl. 180—217 **6 Claims**



1. A three-wheeled motor vehicle comprising, in combination:

(a) a front frame assembly including

(i) a steering column supporting one steerable front wheel,

(ii) a plurality of downwardly extending struts affixed to said steering column, and

(iii) a seat support member extending rearward from said steering column;

(b) a rear frame assembly rotationally coupled to said downwardly extending struts, said rear frame assembly including

(i) an engine mounted thereon,

(ii) a pair of wheels journaled for rotation on axle means mounted on said rear frame assembly and driven by said engine, and

(iii) an arcuate guiderail attached transversely to one of said seat support member and said rear frame assembly at a location above said pair of wheels and forward of said axle means;

(c) first and second slide bearing means attached to the other of said seat support and said rear frame assembly and at spaced-apart locations and fitted about said arcuate guiderail for lateral sliding movement therealong with a predetermined desired frictional resistance therebetween; and

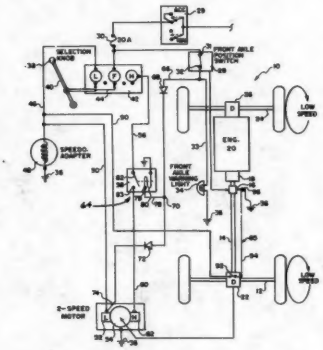
(d) a dashpot coupled between said front frame assembly and said rear frame assembly inhibiting the free rotation of said rear frame assembly relative to said front assembly.

4,592,442

CONTROL SYSTEM FOR A VEHICLE WITH TWO SPEED REAR AXLE AND SINGLE SPEED FRONT AXLE DRIVE

B. Lee Wilson; Ernest J. Fasick; James H. King, and Noel E. Leitzman, all of Fort Wayne, Ind., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 29, 1984, Ser. No. 676,050
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—247 **10 Claims**



1. A control system for a two-wheel/four-wheel drive vehicle having a rear axle which can be operated in a high speed mode or a low speed mode and a front axle which can be drivingly coupled to the engine power train only during rear axle low speed mode of operation, said control system including: first means for sensing when the front axle is drivingly coupled to the power train; second means operatively connected to a speed selection control system of the vehicle for causing said rear axle to be driven in a low speed mode or a high speed mode; and third means coupled to said first means and responsive to sensing of the front axle being drivingly coupled to the power train for preventing said second means from causing said rear axle to be driven in said high speed mode and for forcing said rear axle to be driven in said low speed mode so long as the front axle is drivingly coupled to the power train.

4,592,443

SOBRIETY INTERLOCK

Jack Simon, 7066 Valley Green Cir., Carmel, Calif. 93923

Continuation-in-part of Ser. No. 462,815, Feb. 1, 1983. This application Jan. 16, 1984, Ser. No. 571,013
Int. Cl.[4] B60K *27/08*
U.S. Cl. 180—272 **27 Claims**

1. A sobriety interlock comprising:

a power supply;

a ground terminal;

an "ignition on" input terminal;

an "OK to drive" output terminal;

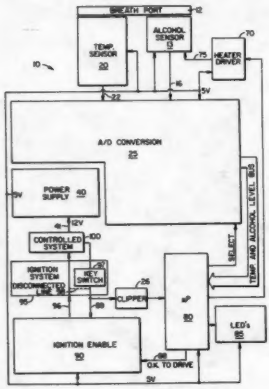
means defining a breath receiving port;

a thermocouple adjacent to and aligned with said port, said thermocouple being connected to said power supply and said ground terminal and having a junction and a temperature output line for electrical signals generated in response to the temperature of a breath sample flowing through said port, said thermocouple having means for heating the junction thereof to a temperature different from that of a breath sample received in said port;

a gas sensor adjacent to and aligned with said port, said gas sensor being connected to said power supply and said ground terminal and having an alcohol level output line

for electrical signals generated in response to the alcohol level of a breath sample flowing through said port;

an analog-to-digital converter having a first input connected to the thermocouple output line, a second input connected to the gas sensor output line, and a plurality of output lines for digital signals indicating the temperature and alcohol level of a breath sample flowing through the port;



a microcomputer responsive to a signal at the "ignition on" terminal to read the digital signals on the converter output lines and to provide a signal at said "OK to Drive" terminal as a function of whether the alcohol level in a breath sample is different from a predetermined level.

4,592,444

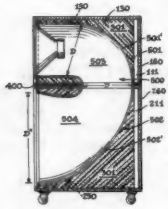
LOW FREQUENCY SPEAKER ENCLOSURE

Stephen M. Perrigo, 15610 SE. Tong Rd., Clackamas, Oreg. 97015

Continuation-in-part of Ser. No. 470,792, Feb. 28, 1983, Pat. No. 4,524,845. This application Apr. 2, 1985, Ser. No. 718,981

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—151 **5 Claims**



1. An improved low frequency speaker enclosure comprising:

an upper cabinet structure comprising an apertured front panel, an apertured bottom panel, and a generally constant diameter tube horn passageway formed between said front panel and said bottom panel by a first pre-formed fiberglass insert;

a lower cabinet structure comprising an apertured front panel, an apertured top panel, and a generally increasing diameter tube horn passageway formed between said top panel and said front panel by a second formed fiberglass insert; and

a low frequency speaker mounted in the apertured face panel of the upper cabinet structure.

4,592,445

SUCTION DEVICE FOR CHAIN SAW

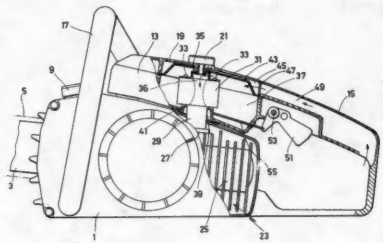
Toshiharu Sawada, Fuchu, Japan, assignor to Komatsu Zenoah Co., Japan

Filed Sep. 13, 1985, Ser. No. 775,834

Claims priority, application Japan, Sep. 26, 1984, 59-144271[U]

Int. Cl.[4] F02M *35/12*

U.S. Cl. 181—229 **4 Claims**



1. A suction device for a chain saw, comprising:

a suction chamber communicating with a suction port of a carburetor for an engine accommodated within the chain saw, said suction chamber being formed to surround said carburetor;

a muffling path formed within a rear handle of the chain saw to pass through said rear handle and provide communication between the suction chamber and atmosphere;

an air filter located between said suction chamber and said muffling path; and

a chamber formed adjacent to said air filter on the side of said muffling path, wherein, according to the rotation of said engine, air is sucked from atmosphere into said chamber through said muffling path, drawn into said suction chamber through said air filter, and sucked into said suction port of said carburetor so that the suction noise of said engine is prevented from propagating outside due to the interference with the internal wall of said muffling path without providing separately for the chain saw a suction muffler or an air cleaner having a suction muffling path.

4,592,446

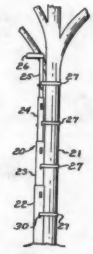
PORTABLE TELESCOPING TREE STAND

Harry B. White, 1656 Longspur Ct., Naperville, Ill. 60565

Filed Nov. 2, 1984, Ser. No. 667,874

Int. Cl.[4] E06C *1/12*

U.S. Cl. 182—93 **13 Claims**



1. A portable telescoping observation stand for attachment to a pole, a tree or like object comprising:

a multi-section, pole-like assembly including a base section and at least one extension section, each section including a hollow elongated member having first and second ends,

said sections having different cross-sectional areas to permit said sections to be assembled together coaxially aligned, one within another, in telescopic engagement, each inner section of the assembly being movable relative to the outermost section of the assembly along a longitudinal axis between a nested position, in which each inner section is substantially contained within said outermost section defining a collapsed configuration for the stand, and an extended position in which a major portion of each inner section extends beyond an adjacent section, defining a extended configuration for the stand and wherein each of said sections has a concave outer surface which is drawn into engagement with the surface of the object along at least first and second lines of contact to substantially eliminate rotation of the stand about its vertical axis;

locking means for releasably locking adjacent sections together in their extended position;

a plurality of foot hold members each removably attachable to a different one of said sections;

securing means for releasably attaching the stand to the object; and

seating means carried by the upper extension section.

4,592,447

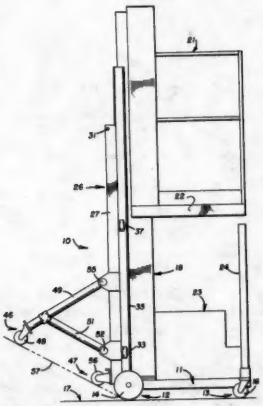
MOVABLE PEDESTAL SCAFFOLD

Michael D. Ream, Lafayette, and Paul C. Guignard, Concord, both of Calif., assignors to Up-Right, Inc., Berkeley, Calif.

Filed Sep. 27, 1985, Ser. No. 781,221

Int. Cl.[3] E04G *1/22, 1/24*

U.S. Cl. 182—127 **5 Claims**



1. A movable pedestal scaffold comprising:

a base member having first and second ends,

first and second wheel means having ground engageable positions defining a work plane, said first wheel means including a pair of spaced-apart co-axial wheels, and said second wheel means including at least one wheel,

means mounting said first wheel means at the first end of said base member and mounting said second wheel means at the second end of said base member,

an elongated mast on said base member at the first end thereof and extending generally perpendicular to said work plane,

a work platform carried on said mast,

a transport frame mounted on said mast for movement thereon in a direction generally perpendicular to said work plane,

means for moving said transport frame along said mast and for holding said transport frame on said mast at selected spacings from said work plane,

third wheel means including at least one wheel,

means mounting said third wheel means on said transport frame for movement therewith and with said third wheel means being spaced away from said mast and away from said work plane.

4,592,448

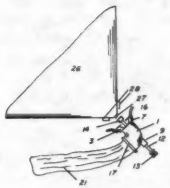
OIL PAN DRAIN RECEPTACLE

Wayne Morris, 6813 Briarhill Rd., Crestwood, Ky. 40014

Filed Sep. 22, 1983, Ser. No. 534,745

Int. Cl.[4] F01M *11/04*

U.S. Cl. 184—1.5 **3 Claims**



1. A device for draining oil from an automotive vehicle oil pan including an elbow shaped conduit; having first and second open ends; a sleeve member located in the outer wall of the conduit member in longitudinally aligned relation with said first end; a shaft slidably received in said sleeve member and having a shaft end with shaft longitudinally movable in said sleeve member toward and away from a drain plug carried by the oil pan when said first end of said conduit is located adjacent said plug with said plug within the periphery of said first end; a socket member having a diameter larger than said sleeve diameter carried by said shaft member shaft end to remove said drain plug with the first end of said conduit adjacent said drain pan, releasable fastener means located adjacent said first end to connect said conduit to said oil pan whereby said shaft is in aligned relation with said drain plug and flexible receiver means to be releasably connected to said second end.

4,592,449

HYDRAULIC POWER PIPING UNIT FOR A LIFT TRUCK

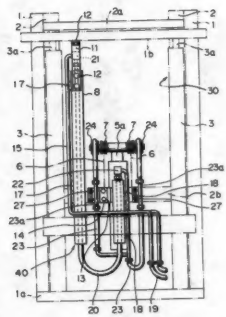
Masataka Sakata, Handa, and Masakazu Asano, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Feb. 21, 1985, Ser. No. 703,909

Claims priority, application Japan, Feb. 23, 1984, 59-026372[U]

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 E **7 Claims**



1. In a lift truck having a truck body and a full free lift upright assembly, the assembly including a pair of laterally

spaced outer stationary masts, a pair of laterally spaced inner masts movable vertically relative to the outer stationary masts, and a free lift cylinder attached to the inner masts for providing a free lift movement for a bracket member relative to the inner masts,

a hydraulic power piping unit for a connection between a hydraulic control valve unit mounted in the truck body and a hydraulic actuator for an attachment to be mounted on the bracket member, comprising:

a pair of laterally spaced first and second vertical hose guide means for respectively receiving therein first and second sections of a first assembly of flexible hydraulic hoses arranged in such a manner that the first flexible hydraulic hose assembly hangs down in a loose U-shape between said first and second guide means, said first vertical hose guide means being fixedly attached to said outer stationary masts and said second vertical hose guide means being attached to one of said inner movable masts and said free lift cylinder for being moved therewith;

a first assembly of rigid hydraulic pipes held by said first vertical hose guide means and stationarily extended so as to connect said first section of the first assembly of flexible hydraulic hoses to a second assembly of flexible hydraulic hoses extending from said hydraulic control valve unit;

a second assembly of rigid hydraulic pipes held by said second movable vertical hose guide means and extended so as to connect said second section of the first assembly of flexible hydraulic hoses to a third assembly of flexible hydraulic hoses extending from said hydraulic actuator; and

pulley means rotatably mounted on a vertical piston rod of said free lift cylinder, for supporting thereon said third assembly of flexible hydraulic hoses so as to permit said third assembly of flexible hydraulic hoses to follow said free lift movement of said bracket member.

4,592,450

ELEVATOR

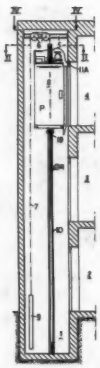
Wolfgang Schaffer, Laxenburger Strasse 117, A-1100 Vienna, Austria

PCT No. PCT/AT82/00023, § 371 Date Apr. 6, 1984, § 102(e) Date Apr. 6, 1984, PCT Pub. No. WO84/00743, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 6, 1982, Ser. No. 597,444

Int. Cl.[4] B66B *11/04, 11/08, 7/04*

U.S. Cl. 187—19 **7 Claims**



1. An elevator for use in a multistory building, the elevator comprising:

a pair of vertical and parallel rails forming a vertical plane and formed with straight-across teeth;

a car vertically displaceable between the rails;

an idler wheel between the rails above the car;

a cable looped over the idler wheel and having two ends, one of which is attached to the car;

a counterweight attached to the other cable end;

respective sprockets rotatable on the car about axes perpendicular to the plane and having straight-across teeth meshing with the rail teeth, the sprockets lying in the plane;

drive means for synchronously rotating the sprockets to vertically displace the car along the plane on the rails;

a hand-operable actuating element in the building outside the car; and

means including a transmission connectable between the element and the idler wheel for manually vertically displacing the car along the rails.

4,592,451

BRAKE LINKAGE FOR VEHICLE FRICTION BRAKES

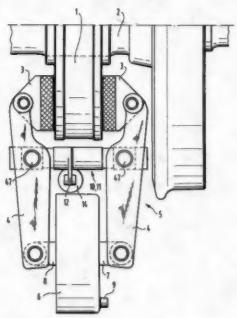
Erling R. Persson, Staffanstorp, Sweden, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,326

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326374

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—71.9 **14 Claims**



1. Brake linkage for vehicle friction brake having an adjustable length vent play regulator (**10**) arranged between two brake linkage elements (**4**) and loaded by means of a brake power motor (**6**) with brake clamping force, said vent play regulator having adjustment means (**17, 33, 34**) for reducing vent play to the desired value and being driven by an auxiliary motor (**14**) when said desired value is exceeded, comprising

(a) means for actuating said auxiliary motor (**14**) before said brake power motor (**6**) at the start of braking;

(b) said auxiliary motor (**14**) changing the length of said vent play regulator (**10**) so as to diminish vent play upon its actuation through said adjustment means (**17, 33, 34**) until said friction brake is applied;

(c) said brake power motor (**6**) subsequently upon its actuation tightly clamping said vehicle friction brake;

(d) said auxiliary motor (**14**), at the end of braking upon decay of the actuation of said brake power motor (**6**), and upon decay of its own activation, readjusting the length of said vent play regulator (**10**) by means of said adjustment means (**17, 33, 34**) in the venting direction of said vehicle friction brake until the desired vent play is attained;

(e) said adjustment means comprising a screw drive having as a first component a threaded spindle (**17**) and as a second component at least one nut (**33, 34**) in screw engagement therewith, one of said components being rotatably controlled by said auxiliary motor (**14**) by way of a one-

way coupling (24) and being rotatably and axially power transmittingly articulated to one of said brake linkage elements, while the other of said components is non-rotatably controlled and is non-rotatably and axial power transmittingly articulated to the other of said brake linkage elements;

(f) said auxiliary motor (14) engaging a turn lever (12) rotatably supported on said rotatably controlled component and coupled thereto by way of a first one-way coupling (24) blocking in the direction of brake applicaton and a first friction coupling (24) overlapping said first one-way coupling;

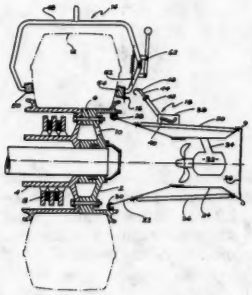
(g) said rotatable component being coupled with an element (33) retained against rotation by way of a second one-way coupling (37) blocking brake venting in the direction of rotation of said rotatable component and by way of a second friction coupling (37) overlapping said second one-way coupling, and in series therewith by way of a play-containing rotational stop (41, 42), each of said friction couplings being stronger than the idling resistance in unlocking direction of the respective one-way coupling not overlapped thereby, said play (x) of said rotational stop (41, 42) corresponding to a pitch of said screw drive (17, 33, 34) which corresponds to the desired vent play;

(h) said first one-way coupling and said first friction coupling sharing a first helical spring (24) wound to be substantially free of play, said turn lever (12) and said threaded spindle (17) having cylindrical surfaces (19, 22) on which said spring is seated to the extent of substantially at least one-half its length, said spring (24) being radially pre-stressed to abut against said cylinder surfaces, the winding direction of said spring being selected so as to cause an increase in its radial pressure against said cylinder surfaces (19, 22) upon rotation of said turn lever (12) in the direction of brake application.

4,592,452
WHEEL BRAKE COOLING APPARATUS FOR AIRCRAFT

Julius Merle, 2 Fabry St., Botany, New South Wales 2019, Australia

PCT No. PCT/AU81/00058, § 371 Date Jan. 13, 1983, § 102(e) Date Jan. 13, 1983, PCT Pub. No. WO82/04108, PCT Pub. Date Nov. 25, 1982
PCT Filed May 13, 1981, Ser. No. 491,203
Int. Cl.⁴ F16D *65/847*
U.S. Cl. 188—264 AA **12 Claims**

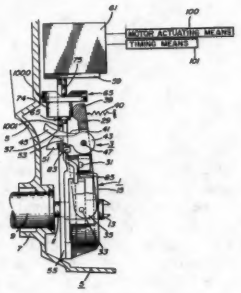


1. A wheel brake cooling apparatus for aircraft comprising a clamp assembly for attachment to an aircraft tire, a duct adapted to be clamped by the clamp assembly against an aircraft wheel upon which the tire is fitted, and a fan arranged, when activated, to draw cooling air through the wheel brake assembly via the duct, wherein the clamp assembly comprises a tire-straddling, U-shaped frame with a first tire engaging pad for one sidewall of the wheel and a second tire engaging pad for the opposite side wall and means to clamp the pads against the tire, the frame being made of a major part, the length of which exceeds the greatest sidewall to sidewall width of the tire, which part carries an inwardly directed pad for engaging one sidewall and a minor part which is pivoted to the major part, which minor part carries a complementary pad for engagig the opposite sidewall and a lever operated linkage for clamping the pads on the Two parts of the frame to the tire.

4,592,453
LOCK ACTUATOR ASSEMBLY

Aaron M. Fish, Hampstead; Jean-Paul Dausseing, Laval, and Leon Mayzels, Montreal, all of Canada, assignors to Ilco Unican Inc., Montreal, Canada

Filed Mar. 27, 1984, Ser. No. 593,833
Int. Cl.⁴ F16D *43/26*
U.S. Cl. 192—0.02 R **12 Claims**



1. An actuator assembly comprising:

a clutch mechanism having an input disc and an output disc;

means for rotating said input disc;

means for preventing rotation of said output disc with said input disc when said assembly is in a rest condition, and for effecting a rotation transmitting connection between said input disc and said output disc when said assembly is in an actuated condition;

means for automatically returning said assembly from said actuated condition to said rest condition: (1) if said input disc is rotated within a given time delay, upon said rotation; or, (2) if said input disc is not rotated within said given time delay, upon the expiration of said time delay;

whereby, said output disc can be rotated only once within said time delay, and whereby said output disc is not rotatable if said input disc is not rotated within said time delay.

4,592,454
HYDROPNEUMATIC SYSTEM FOR RECOVERING BRAKING ENERGY FOR URBAN VEHICLES

Robert Michel, Paris, France, assignor to Renault Vehicules Industriels, Lyons, France

Filed May 16, 1983, Ser. No. 495,024
Claims priority, application France, May 19, 1982, 82 08855
Int. Cl.⁴ F16D *33/00*; B60K *25/06*
U.S. Cl. 192—3.23 **8 Claims**

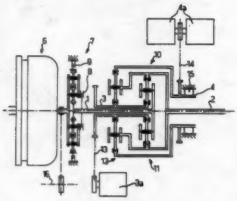
1. A hydropneumatic system for recovering braking energy for a vehicle which has a "power shunt" transmission, comprising,

a transmission including a differential mechanism which has four shafts, said shafts including an input shaft which is connectible by a torque converter to an engine, an output shaft which is connectible to vehicle wheels, and two shafts which are connectible to two hydraulic machines, and a freewheel on one of said shafts to prevent rotation thereof when starting on the torque converter; two hy-

draulic machines which are driven by said two shafts of the transmission, said hydraulic machines having variable capacity cylinders,

a hydropneumatic accumulator connected by conduits to the hydraulic machines and being connectible to said hydraulic machines while said input shaft is being driven to provide for hybrid operation of the system, two hydraulic switches in said conduits,

electronic computer means for controlling the hydraulic switches and the hydraulic machines, said computer means being operable to change the capacities of the cylinders of the hydraulic machines to provide automatic and continuous control of the transmission throughout its various operating phases, said operating phases including



phases when a first one of the hydraulic switches changes the transmission from pure mechanical drive mode or pure hydraulic drive mode to a hybrid drive mode which is partly mechanical and partly hydraulic, said operating phases also including a phase when a second one of the hydraulic switches changes the transmission from an energy recovering braking mode to a drive mode,

said computer means being operable during said hybrid drive mode to adjust the cylinders to capacities at which the ratio of the torques of the shafts connected to the hydraulic machines are very close to an operating point which cancels input torque to the transmission, said system also having means for controlling engine speed with respect to vehicle speed.

4,592,455

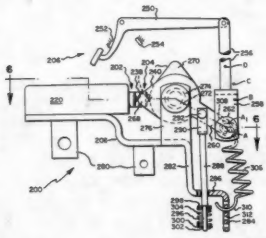
CLUTCH AND TRANSMISSION BRAKE ASSEMBLY

John Bubak, Pontiac, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jun. 28, 1983, Ser. No. 508,794

Int. Cl.[4] F16D *67/04, 25/062*

U.S. Cl. 192—13 R **9 Claims**



1. A clutch and transmission brake assembly capable of permitting a transmission to be driven by a motor when the clutch is engaged and of braking the transmission after the clutch has been disengaged, said assembly being characterized by

a clutch movable between engaged and fully disengaged positions and capable to causing a transmission to be driven when it is in its engaged position and not to be driven when in its disengaged position, the clutch including a fluid pressure operated piston;

a transmission brake disposed between the clutch and the transmission and movable between engaged and disengaged positions and capable of causing the transmission to be braked when in the engaged position, the transmission brake including a fluid pressure operated piston;

first engaging means capable of causing the clutch to be shifted between engaged and fully disengaged positions;

second engaging means capable of causing the transmission brake to be shifted between disengaged and engaged positions; and

operating means including a pedal movable between first and second positions through a dwell position and capable of causing said first and second engaging means to be sequentially operated to cause said clutch to be shifted from an engaged to a fully disengaged position as the pedal moves from the first position to the dwell position, and then to cause the transmission brake to be shifted from a disengaged to an engaged position as the pedal moves from the dwell position to the second position the operating means further including force applying means capable of causing pedal effort to increase as the pedal is initially moved from the dwell position towards the second position.

4,592,456

VISCOUS COUPLING FOR A COOLING AIR FAN

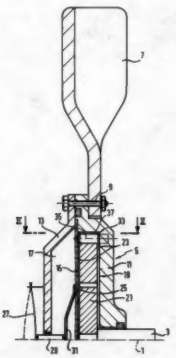
Dieter Neugebauer, Sennfeld, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,741

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328646

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—58 B **15 Claims**



1. In a viscous coupling for a cooling air fan, comprising:

(a) a drive shaft rotatable about a rotation axis,

(b) a housing rotatable in relation to the drive shaft, having a partition which divides it into a reservoir for a viscous shear fluid and a working chamber,

(c) a rotor non-rotatably retained on the drive shaft and arranged in the working chamber, which rotor together with the housing and its partition defines at least one shear gap,

(d) a controllable valve device connecting the reservoir with the working chamber,

(e) an annular space, adjoining the partition on the side of the working chamber and being at least partially defined by the rotor, in the region of the external circumference of the rotor,

(f) at least one over-flow opening in the partition, connecting

the annular space with the reservoir for flowing shear fluid therebetween,

(g) at least one pump element protruding into the annular space and guided between two end positions in relation to the over-flow opening, said pump element being formed as a baffle flap mounted to be freely pivotable between the end positions about a flap axis extending transversely of the circumferential direction of the annular space, and said baffle flap can be displaced into the two end positions by the shear fluid in dependence on the direction of flow of the shear fluid in the annular space.

4,592,457

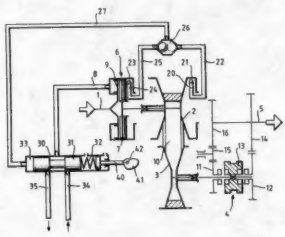
INFINITELY VARIABLE V-BELT TRANSMISSION FOR A MOTOR VEHICLE

Theodorus P. M. Cadee, Goirle, Netherlands, assignor to Van Doorne'S Transmissie B.V., Tilburg, Netherlands

Filed May 16, 1984, Ser. No. 610,796

Int. Cl.[4] F16D *43/284*

U.S. Cl. 192—0.076 **2 Claims**



1. In a motor vehicle transmission including an infinitely variable V-belt transmission having a primary pulley connected to an annular channel having a closed peripheral surface and into which a stationary pitot tube terminates for sensing the pressure of fluid present in the channel in order to produce a fluid-pressure signal proportional to the speed of rotation of the primary pulley, and including a driving-away clutch for connecting an input shaft to the primary pulley, the improvement wherein the driving-away clutch is a wet plate clutch operated by fluid pressures, the input shaft being connected to a second annular channel having a closed peripheral surface into which a second stationary pitot tube terminates for sensing the pressure of a fluid present in the second channel in order to produce a fluid-pressure signal proportional to the speed of rotation of the input shaft, means for continuously transmitting one of the fluid-pressure signals and control means responsive to the fluid-pressure signal transmitted by said transmitting means for regulating the fluid pressure employed for operating the wet plate clutch.

4,592,458

CLUTCH DEVICE FOR WORKING VEHICLES

Ikuo Matsuki, Tokyo; Yasushi Itai, and Kenji Nakamura, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,323

Claims priority, application Japan, Jul. 22, 1983, 58-134827

Int. Cl.[4] F16D *43/24*

U.S. Cl. 192—83 **5 Claims**

1. A clutch device for working vehicles, comprising:

a pressure member integrally rotatable with a crankshaft of an internal combustion engine of the vehicle;

a centrifugal weight supported by said pressure member;

said centrifugal weight being centrifugally movable in a higher revolution region than a predetermined number of revolutions of said crankshaft;

a clutch outer member driven to be rotated by said pressure member;

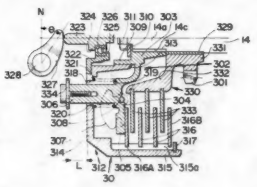
said clutch outer member being movable axially of said pressure member;

a plurality of drive friction plates disposed inside of and integrally supported by said clutch outer member;

said drive friction plates being axially movable with the axial movement of said clutch outer member as well as with the centrifugal movement of said centrifugal weight;

a clutch inner member freely rotatably fitted arranged on said crankshaft, said clutch inner member being fixedly provided with a plurality of driven friction plates frictionally engageable with said drive friction plates and having an output portion connected to a working implement of the vehicle;

resiliently biassing means for resiliently biassing both said pressure member and said clutch outer member in an



engagement direction of said drive and driven friction plates;

said resiliently biassing means being disposed between said pressure member and said clutch outer member;

a restriction member for rotatably supporting said clutch outer member and restricting the axial movement of said clutch outer member;

said restriction member being disposed on the axis of said crankshaft; and

control means for controlling to shift said restriction member such that said clutch outer member has an axial position thereof restricted by said restriction member, to be an arbitrary element of a set consisting of, with respect to said drive and driven friction plates, a normal-open position, a frictional-engagement permitting position under effect of the centrifugal movement of said centrifugal weights, and a normal-close position.

4,592,459

ELASTIC TORQUE TRANSMISSION UNIT

Helmuth Weissenberger, Theilheim, and Karl-Heinz Werner, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,314

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 8309042[U]

Int. Cl.[4] F16D *3/66*

U.S. Cl. 192—106.2 **19 Claims**

1. In an elastic torque transmission unit, particularly for use in the torque transmission path between a combustion engine and a driving wheel of a motor vehicle,

said elastic torque transmission unit comprising

(a) a middle disc (**3**) having an axis, a middle plane perpendicular to said axis, a radially outer circumferential edge, two side faces substantially perpendicular with respect to said axis and first connecting means (**4**) for torque transmitting connection to a first torque transmitting member;

(b) two cover discs (**5, 6**) each adjacent a different side face of said middle disc (**3**), respectively, having an axis substantially coinciding with said axis of said middle disc (**3**) and being interconnected for common rotation with respect to said middle disc (**3**) about said axes;

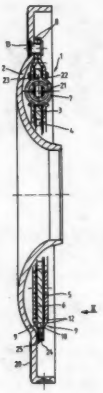
(c) a plurality of compression springs (**7**) accommodated in axially aligned windows (**21, 22, 23**) of said middle disc (**3**)

and said cover discs (5, 6), said helical compression springs (7) having axes substantially tangential with respect to said axis of said middle disc (3) and having end portions engaging circumferentially spaced edges of said windows (21, 22, 23);

(d) second connecting means (8, 13) connecting said cover discs (5, 6) to a second torque transmitting member (2), said second connecting means (8, 13) being located in circumferentially spaced locations of said cover discs (5, 6) radially outwardly of said circumferentially outer edge of said middle disc (4);

(e) each of said cover discs (5, 6) including at least one circumferential zone (24, 25) circumferentially extending between adjacent locations of said second connecting means (13) and radially extending beyond said radially outer circumferential edge of said middle disc (3);

(f) said cover discs (5, 6) being approached towards each other within the respective zone (24, 25);



(g) said cover discs (5, 6) being, when regarded in a section plane containing said axis of said cover discs (5, 6) and extending through said zone (24, 25), symmetrical with respect to said middle plane of said middle disc (3);

(h) said cover discs (5, 6) being provided in the respective zones (24, 25) with axially aligned recesses (9);

(i) said middle disc (3) having at least one radial projection (10) beyond said radially outer circumferential edge and in axial alignment with said recesses (9), said radial projection (10) having a circumferential width smaller than the circumferential width of said recesses (9);

(k) said radial projection (10) having circumferentially spaced terminal edges (26, 17) in circumferential alignment with respective circumferentially spaced terminal edges (11, 12) of said recesses (9) such as to limit angular deflection of said middle disc (3) with respect to said cover discs (5, 6).

4,592,460

CLUTCH DISC

Friedrich Kittel, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,463

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405949

Int. Cl.[4] F16D *3/66*

U.S. Cl. 192—106.2 **13 Claims**

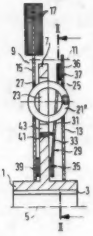
1. In a clutch disc for a motor vehicle friction disc clutch, comprising:

(a) a hub part defining a rotation axis and having a first disc extending substantially radially of the rotation axis;

(b) a disc part mounted rotatably through a limited maximum angle of rotation about the rotation axis on the hub part; said disc part being provided with clutch friction linings, and with at least one second disc arranged axially laterally of the first disc and extending substantially radially of the rotation axis,

(c) several torsional vibration springs held in windows of the first disc and of the second disc, said torsional vibration springs being resiliently stressable in the relative rotation of the hub part and of the disc part, at least one of said torsional vibration springs being stressable with play in the circumferential direction to provide a multi-stage rotational elasticity characteristic,

(d) a control disc arranged rotatably in relation to the hub part and the disc part axially between the first disc and the second disc, said control disc being coupled non-rotatably but with predetermined rotational play less than said



limited maximum relative angle of rotation, with the first disc or the second disc and co-operates with said at least one torsional vibration spring being stressable with play in the circumferential direction,

(e) friction face pairs pressed axially resiliently against one another, on axially both sides of the control disc, at least one first pair of said friction face pairs transmitting a friction torque between the first disc and the control disc and at least one second pair of said friction face pairs transmitting a friction torque between the second disc and the control disc, the friction torques of the first and the second friction face pairs being of different magnitudes, the improvement comprising the control disc being formed as an axially resilient component and being braced in by means of the first friction face pair and the second friction face pair between the first disc and the second disc.

4,592,461

VENDING MACHINE WITH COIN SORTER AND TOTALIZER

Evelyn Friedman, P.O. Box 149, Whitehall, N.Y. 12887, and William R. Carswell, Whitehall, N.Y., assignors to Evelyn Friedman, Whitehall, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,848

Int. Cl.[4] G07F *3/04, 5/08*

U.S. Cl. 194—227 **19 Claims**

1. In a vending machine having a coin operated mechanism which includes:

(a) a coin sorter for separating coins, deposited in the machine, into different denominations;

(b) a coin chute assembly comprising at least one generally vertical chute through which coins of a denomination, from the coin sorter, fall;

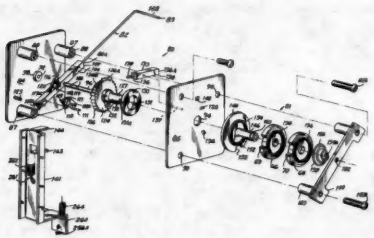
(c) a trip wire, one end of which extends through the chute in the coin chute asembly and can move downwardly in the chute with downward movement of a coin through the chute along a measured distance in the chute;

(d) a totalizer, connected to the other end of the trip wire, for counting the value of coins which fall through the chute in the coin chute assembly; and

(e) a vending controller connected to the totalizer; the improved totalizer which comprises:

a lever which is connected at one end to the other end of the trip wire and is rotatably connected between its ends to the mechanism; said one end of the lever moving downward about its center of rotation with downward movement of said one end of the trip wire;

a first dog, rotatably connected to the lever between an adjacent end of the lever and the center of rotation of the lever; one end of the first dog extending toward said center of rotation and being adapted to revolve about the rotatable connection of the first dog to the lever, so as to move vertically relative to the lever; and



a ratchet wheel, parallel to the lever and the first dog and located on the same side of the lever as the first dog; the ratchet wheel being adapted to rotate about said center of rotation; said one end of the first dog being adapted to urge a tooth on the circumference of the ratchet wheel to revolve in one direction about said center of rotation with revolution of the first dog about said center of rotation when said one end of the lever moves downwardly with said one end of the trip wire; a tooth on the ratchet wheel that is higher than the other teeth; spring means for urging the ratchet wheel to rotate about said center of rotation in a direction opposite to said one direction; and a stop connected to the mechanism and adapted to abut against the higher tooth to stop the ratchet wheel from rotating in said opposite direction.

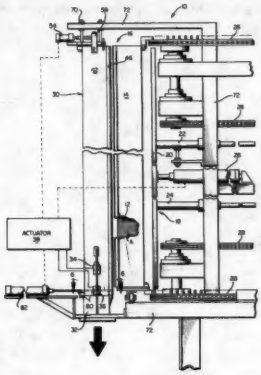
4,592,462

CAROUSEL TYPE FEEDER FOR CARTON BLANKS

Wallace W. Mojden, Hinsdale, and Robert E. Darr, Chicago, both of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Filed Jun. 15, 1983, Ser. No. 504,573
Int. Cl.[4] B65G *43/08*
U.S. Cl. 198—464.2 **10 Claims**

1. In an apparatus for supplying box flats or like articles to a processing device, the apparatus comprising a plurality of carrier pocket devices movable to and away from an article delivery station, and receiver pocket means at the article delivery station, the receiver pocket means including elongate upstanding side support members for retaining received articles, the side support members being at least partly defined by margins confronting a carrier pocket device located at the delivery station, the improvement comprising spreader means for moving the elongate side support members laterally of the receiver pocket means and away from each other thereby spreading the side support members apart from one another to facilitate delivery of articles from the carrier pocket device to



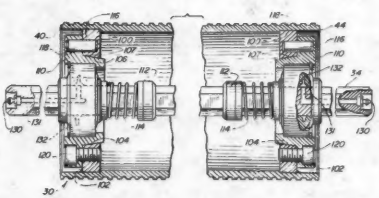
the receiver pocket means and to prevent damage to the articles during entry into said receiver pocket means.

4,592,463

ROLLER WITH DOUBLE LEFT AND DOUBLE RIGHT HELIX PATTERN TRACK

Halil Puskar, 1200 Andria La., Des Plaines, Ill. 60018

Filed Jul. 5, 1984, Ser. No. 627,990
Int. Cl.[4] B65G *39/10, 39/16*
U.S. Cl. 198—842 **5 Claims**



1. A generally cylindrical belt roller comprising, at least one stationary mounting plate as secured to an end of the roller, said plate including a centrally located seat for receipt of a removable housing retained on said seat by at least one attachment bolt which passes through both said housing and said plate, and at least one housing removal screw passing through the housing and abutting the surface of the mounting plate to assist in removal of the housing from the plate after said at least one bolt has been removed.

4,592,464

FOLDING DISPLAY MERCHANDISE BOX

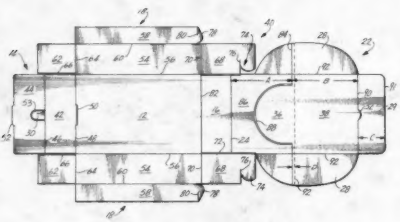
David G. Londagin, 1431½ Verd Oaks Dr., Glendale, Calif. 91205

Filed Jun. 15, 1984, Ser. No. 620,875
Int. Cl.[4] B65D *79/00*
U.S. Cl. 206—45.28 **5 Claims**

1. A display container of the type having a bottom, upstanding front and rear walls and sides defining an upwardly open compartment and a top connected to the rear wall along a hinge to close the container compartment, the improvement comprising:

a top including a support panel having a first length extending from the hinge to a first score, a display panel having a second length greater than the first length and extending from the first score to a second score and a lock flap

extending from the second score and terminating at a leading edge, said flap foldable about said second score to lie adjacent the front wall when the container is closed, said top being foldable about the first score to an upstanding mast position wherein the front and rear panels are



superposed and the flap lies adjacent the rear wall, in said mast position the leading edge lying contiguous the bottom whereupon the second score is offset with respect to the hinge to strengthen the upstanding position of the mast; and

means for holding the top the top in said mast position.

4,592,465

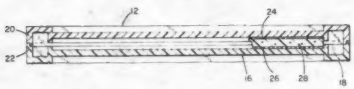
COIN DISPLAY CASE

Edmund W. E. Stein, Dover, Mass., assignor to Design Pak, Incorporated, Marlboro, Mass.

Filed Nov. 14, 1983, Ser. No. 551,288

Int. Cl.[4] A45C *11/24*

U.S. Cl. 206—0.83 **3 Claims**



1. A coin display case comprising

an outer lens,

an inner lens, and

a central laminate,

said laminate being held between said outer lens and said inner lens,

said laminate having at least one hole therethrough for accepting therein a coin to be displayed and held cooperatively with said outer lens and said inner lens, and

said laminate comprising a layer of flexible foamed material sandwiched between two layers of sulfur-free acid neutral paper.

4,592,466

CONTAINER CARRIER AND PACKAGE

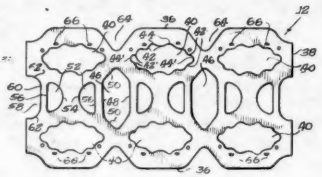
Peter J. Walters, Roselle, and William N. Weaver, Northbrook, both of Ill., assignors to Illinois Tool Works Inc.

Filed Mar. 25, 1985, Ser. No. 715,557

Int. Cl.[4] B65D *85/66*

U.S. Cl. 206—150 **1 Claim**

1. A carrier for carrying a plurality of containers provided with a cover incorporating a skirt which extends downwardly from the upper extremity of the container, the carrier comprising a substantially unsupported sheet of plastic material having a longitudinal dimension, said sheet of plastic material being resilient, deformable and elastic and having a plurality of apertures therein, each of said apertures being elongated longitudinally of said carrier and having a scalloped margin comprising alternating tabs and scallops arranged to locate scallops at the longitudinal extremities of the apertures, the tabs adjacent the longitudinal extremities being shorter than the tabs of the other regions of the apertures, the circumferential dimension of each of said apertures through the apices of the scallops being less than said circumference whereby the margin of each of said apertures must be stretched and flexed to receive a container,



wherein the location and dimension of the tabs and scallops permit signficant stretching of the carrier respective to lateral stretching forces yet permitting at least portions of the tabs to overlie the lowermost edge of the skirt of the cover.

4,592,467

DEVICE INSTALLED IN PASSENGER CARS FOR SMASHING WINDOWS AFTER TRAFFIC ACCIDENTS

Helmut Lechner, Forellenweg 1, 359o Bad Wildungen-Wega, Fed. Rep. of Germany

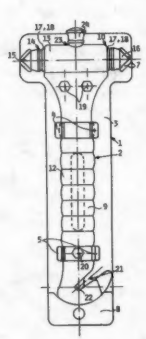
PCT No. PCT/DE83/00185, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/01917, PCT Pub. Date May 24, 1984

PCT Filed Nov. 10, 1983, Ser. No. 637,213

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 8232386[U]

Int. Cl.[4] B25F *1/00;* **B25D** *1/00;* **B25B** *27/00*

U.S. Cl. 206—349 **2 Claims**



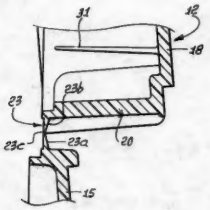
1. A device in motor vehicles for smashing windows after traffic accidents, comprising: a holding plate with mounting means; a hammer for smashing the windows; clip means for attaching said hammer to said holding plate, said holding plate having a T-shaped base; said hammer having a head with two symmetrical tips; said hammer having a handle with a free end carrying a cutting blade for cutting safety belts; protective walls on said holding plate at end regions of the T-shape for covering said hammer tips and said free end of said hammer handle; a continuous metal insert element in said hammer head for holding said hammer tips; said hammer head having walls surrounding said insert element; said hammer handle comprising two half-shells connected to each other; said hammer handle having an open-edged notch passing through said half-shells in vicinity of said free end of said handle; said holding plate having two sliding needles for mounting said holding plate; said needles having a U-shape and extending while sliding in recesses of ramp-shaped projections on said holding plate.

4,592,468

CUSHIONING CONTAINER

Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005, assignor to Robert S. Wallace, Los Angeles and Jack Bauman, Pacific Palisades, both of, Calif., a part interest

Filed Jun. 13, 1985, Ser. No. 744,254
Int. Cl.[4] B65D *85/672, 81/02*
U.S. Cl. 206—387 **17 Claims**



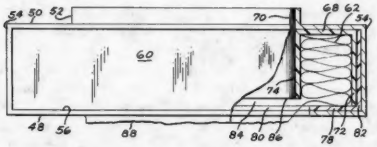
1. A container, comprising
(a) a receptacle and a cover therefore, the receptacle having a bottom wall and the cover having a top wall,
(b) fin means integral with at least one of said walls and projecting toward the other of said walls to engage an article placed within the container and between said walls when the cover is closed onto the receptacle,
(c) said fin means being yieldably deflectible in response to squeezing of the article between said walls,
(d) and fastener means associated with the receptacle and cover to hold the cover closed on the receptacle with said article squeezed and thereby positioned with said fin means in deflected state,
(e) said fin means comprising fins extending in generally parallel planes and having terminal edges that define an article positioning plane relatively to which said fin planes are out of perpendicularlity.

4,592,469

STORAGE CARTRIDGE FOR PLASTIC SHEET TUBING

John L. Gaither, Louisville, Ky., assignor to Richard L. Caslin, Louisville, Ky.

Division of Ser. No. 543,615, Oct. 20, 1983, Pat. No. 4,550,553. This application Aug. 22, 1985, Ser. No. 768,139
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—494 **4 Claims**



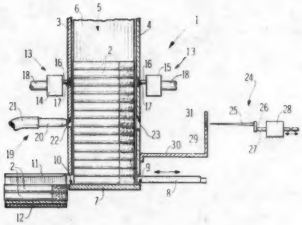
1. A compact annular cartridge holding a supply of large plastic sheet tubing that is folded longitudinally into the cartridge, where the cartridge comprises:
a. a hollow, box-like, flattened housing having a first large opening in the top wall and a second large opening in the bottom wall generally aligned with the first opening;
b. a hollow core formed in the housing and centered with respect to the top opening and suspended from the top wall a distance that would provide a narrow slot between the periphery of the bottom opening and the periphery of the bottom edge of the core;
c. the bottom wall of the housing being removable so that a long length of the said large plastic sheet tubing may be loaded into this cartridge housing in the area bounded by the outside of the hollow core and the interior of the vertical walls of the housing, and the said narrow slot serves as a restraining means for resisting the wholesale removal of the plastic sheet tubing from the cartridge so the sheet tubing may be dispensed only one length at a time through the slot by exerting a tension force on the end of the sheet tubing positioned within the bottom opening.

4,592,470

DEVICE FOR INFEEDING CIGARETTES TO THE WRAPPING LINE OF A PACKER

Riccardo Mattei, and Gastone Dall'Osso, both of Bologna, Italy, assignors to G. D. Società per Azioni, Bologna, Italy

Filed Nov. 2, 1984, Ser. No. 667,734
Claims priority, application Italy, Dec. 7, 1983, 3650 A/83
Int. Cl.[4] B07C *5/344;* A24C *5/32*
U.S. Cl. 209—535 **7 Claims**



1. Device for infeeding cigarettes to the wrapping line of a packer, comprising a hopper for supplying the cigarettes, the lower part of said hopper being subdivided into a plurality of outgoing channels of a dimension virtually identical to the diameter of one cigarette, through which the cigarettes, placed in stacks, descend in steps; sensor means provided along each of said channels for checking the cigarettes in succession; at least one ejector device for each channel interconnected to a respective said sensor means for the expulsion from said channel of faulty cigarettes; and a contrivance for the interception and rejection of said faulty cigarettes, placed on the opposite side of said hopper from at least one ejector device provided with means for engaging with and restraining said faulty cigarettes during the expulsion thereof from each said channel, and movable parallel to the axis of said cigarettes between two extreme positions, one spaced away from said hopper at a distance less than the length of said cigarettes, and the other, at a distance greater.

4,592,471

BAKEWARE ORGANIZER

Elly Bross, Montreal, Canada, assignor to Stanbel, Inc., Montreal, Canada

Filed Apr. 2, 1985, Ser. No. 719,206
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—41 **10 Claims**

1. An adjustable storage rack comprising:
an elongated rectangular base member having an upper surface with a central longitudinal channel and a plurality of spaced lateral grooves formed therein,
said longitudinal channel having an open end and a constant width extending the entire length of said base member and having a pair of flanges extending inwardly along the length of said channel defining a top opening of said channel narrower than said channel width,
said lateral grooves extending the entire width of said base member and defining ridges therebetween,

said channel having a bottom wall spaced below said flanges,

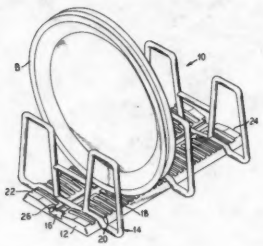
at least one vertical support member,

said support member having a foot portion receivable in said open end of said channel, cpatured by said flanges and free to slide the length of said channel,

said support member having a central vertical arm extending upwardly from said foot portion and dimensioned to pass through said top opening in said channel,

said support member having a pair of opposed lateral arms extending from said central vertical arm,

said support member having at least one vertical arm extending upwardly from said lateral arms,



said support member being selectively slidable along the length of said member and being slightly tiltable in said channel such that said foot portion is frictionally lockable against said flanges and said bottom wall,

said lateral arms being spaced slightly above said ridges when said support member is held in a vertical orientation, and when said support member is tilted in said channel, said lateral arms moving below the level of said ridges and being received in said lateral grooves to further lock said support member in place,

whereby said supports can be secured in selected places relative to said base member to vertically support bakeware and other items held in said rack.

4,592,472

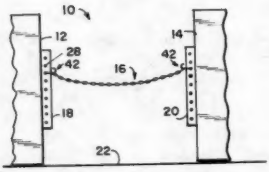
PORTABLE, LIGHTWEIGHT CLOTHESLINE ASSEMBLY

Umberto E. Carnera, P.O. Box 1616, Dunedin, Fla. 33528

Filed Nov. 28, 1984, Ser. No. 675,873

Int. Cl.[4] D06F *53/00*

U.S. Cl. 211—119.01 **2 Claims**



1. A portable clothesline assembly, comprising:

a pair of spaced apart, upstanding support surface elements;

a pair of mounting strip elements, each member of said pair of mounting strip elements being fixedly secured to an associated support surface element;

each member of said pair of mounting strip elements having the form of an angle iron, both of the walls of which have formed therein a plurality of spaced apertures;

an elongate, flexible chain;

said chain formed by a plurality of interconnected link members;

first and second bracket members;

each of said bracket members having first and second opposed ends;

the respective first ends of said bracket members being formed so as to be releasably secureable to the opposite ends of said chain;

the respective second ends of said bracket members being formed so as to be releasably engageable with preselected apertures formed in an associated mounting strip element;

and each of said link members providing a support means from which a clothes hanger may be suspended.

4,592,473

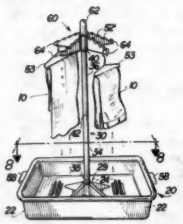
CLOTHES DRYING RACK AND ACCOMPANYING RECEPTACLE

Harriet Efrom, 4533 Adams Ave., Miami Beach, Fla. 33140

Continuation-in-part of Ser. No. 535,915, Sep. 26, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 727,160

Int. Cl.[4] A47B *47/00*

U.S. Cl. 211—205 **12 Claims**



1. A clothing drying assembly of the type primarily designed to support clothes and like articles for drying, said assembly comprising:

(a) support means structured for support of clothing thereon and including a stanchion and a mounting means,

(b) receptacle means for catching water from clothes drying on said support means and being removably connected in supporting relation to said stanchion and disposed in underlying relation to said mounting means,

(c) said stanchion extending upwardly from said receptacle means and said mounting means removably connected to said stanchion at an opposite end thereof relative to said receptacle means and in overhanging relation to said interior of said receptacle means,

(d) connecting means connected to said receptacle means and structured for support and engagement of one end of said stanchion in said upwardly extending relation to said receptacle means,

(e) said mounting means comprising an arm means for attaching clothes on said support means and removably securable to said stanchion in spaced, overhanging relation to an interior of said receptacle means,

(f) said arm means comprising a hollow interior portion being open and accessible from an under portion of said arm means, said arm means being dimensioned and configured for removable overlying engagement with said connecting means when detached from said stanchion,

(g) said receptacle means further structured to retain said stanchion and said arm means in at least partially surrounding relation within said receptacle, when detached from one another, and

(h) said connecting means is at least partially configured and dimensioned to correspond to said arm means and positionable in retaining, supporting engagement within said hollow interior portion, said arm means being removably

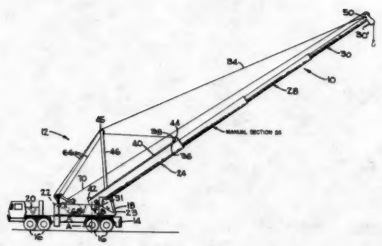
retained within said receptacle interior when detached from said stanchion.

4,592,474

COUPLING AND LATCHING MECHANISM FOR EXTENSIBLE BOOM

Robert A. Rathe, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 293,729, Aug. 17, 1981, Pat. No. 4,492,311. This application Oct. 30, 1984, Ser. No. 652,234
Int. Cl.[4] B66C *23/04*
U.S. Cl. 212—267 **3 Claims**



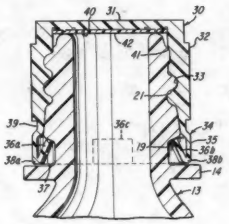
1. In a crane or the like having an operator's cab and a multi-section telescopic boom including a base boom section, a manual boom section, and at least one additional boom section, power means having one part connected to said additional section and an extensible and retractable rod means; the improvement which comprise first coupling means supported on said base section in position to be coupled to said rod means; second coupling means supported on said manual section in position to be coupled to said rod means; said rod means supporting a first and second transversely extending pin; said first coupling means comprising at least one pair of cooperating jaws movable between a position coupled to said first pin and a position uncoupled from said pin; said second coupling means comprising at least one pair of cooperating jaws movable between a position coupled to said second pin and a position uncoupled from said second pin; first jaw locking means movable between a position locking said first jaws in coupled engagement with said first pin and a position uncoupling said first pin from said first jaws; second jaw locking means movable between a position locking said second jaws in coupled engagement with said second pin and a position uncoupling said second pin from said second jaws; first latch means adapted to latch said manual section in a selected one of a plurality of positions to said base section; second latch means adapted to selectively latch said manual section to said additional section; first control means operabler from said cab when in one operative position for controlling said coupling means and said latch means in a manner permitting extension and retraction of said manual section relative to the base section by said power means; and when in a second operative position for controlling said coupling means and said latch means for permitting extension and retraction of said at least one additional boom section relative to said manual section, and second control menas in said cab for extending and retracting said rod means on said power means.

4,592,475

PLASTIC CLOSURE WITH MECHANICAL PILFER-PROOF

Charles N. Hannon, 27 Sargent Rd., Scarsdale, N.Y. 10583, and Leonard J. Vallender, Valhalla, N.Y., assignors to Charles N. Hannon, Scarsdale, N.Y.

Continuation-in-part of Ser. No. 447,284, Dec. 6, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 679,706
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **16 Claims**



1. A molded, one-piece plastic closure for attachment gastight to a container having a body, a threaded neck extending from the body, and a bead extending outwardly from the neck between the threaded portion and the body and having a shoulder facing the body and extending from the intersection with the neck out to the outer part of the bead, said closure comprising:

(1) an end member;

(2) a generally cylindrical skirt integrally molded with the end member and extending away from the end member, the skirt comprising an internal thread to engage the neck; and

(3) a pilfer-proof molded integrally with the closure at the edge of the skirt remote from the end member and comprising:

(a) a ring,

(b) means comprising at least one region of the pilfer-proof weaker than immediately adjacent regions of the pilfer-proof to be visibly torn by force exerted thereon by the removal of the closure from the container, and

(c) a plurality of hooks to engage the shoulder when the closure is being unscrewed from the container, each of the hooks comprising:

(i) a main portion in the form of a sector of a generally frusto-conical shell that has a generally inwardly facing surface and a frusto-conical convex generally outwardly facing surface extending longitudinally between a first curved edge of larger radius of curvature at one axial end of the shell and a second curved edge of smaller radius of curvature at the opposite axial end of the shell, the frusto-conical shape making each sector substantially impervious to bending in response to compressive force exerted longitudinally along the shell and of smaller magnitude than the compressive force that must be exerted thereon of sufficient magnitude to tear the weakened region, each of the sectors extending inwardly from the edge of the ring remote from the skirt and at an angle toward the end member, the convex surface of each sector facing generally outwardly toward a respective portion of the inwardly facing surface of the ring, and

(ii) hinge means integrally molded with the first curved edge of the respective sector and with a part of that edge of the ring which is remote from the skirt, whereby the hinge means joins the first edge of the respective sector to the ring, the hinge means being sufficiently flexible with respect to the ring to allow the respective sector to pivot substantially only toward and away from a respective portion of the

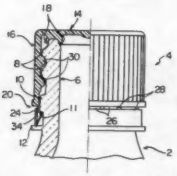
inwardly facing surface of the ring, the respective portion of the inwardly facing surface of the ring being spaced from the axis by a distance not substantially greater than the radius of the outer part of the bead plus the thickness of the frusto-conical shell, whereby each of the hooks can be pivoted to a position such that its generally inwardly facing surface is spaced from the axis by a distance at least substantially as great as the outer part of the bead.

4,592,476

COMBINATION OF A CONTAINER AND A CLOSURE

Seikuro Yasada, Fujisawa, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00320, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985
PCT Filed Jun. 19, 1984, Ser. No. 721,116
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **13 Claims**



1. A combination comprising

a container having a mouth-neck portion having formed on its peripheral surface an external thread and an annular anchoring flange located beneath the external thread, and

a closure comprised of a top panel wall having a peripheral edge and a cylindrical skirt wall extending downwardly from the peripheral edge of the top panel wall,

said skirt wall having formed therein a circumferentially extending breakable line to divide the skirt wall into a main portion above the breakable line and a pilferproof skirt portion below the breakable line,

said main portion having an inner circumferential surface and formed in said surface an internal thread to be screwably engaged with the external thread on the mouth-neck portion,

wherein said pilferproof skirt portion has an inner circumferential surface and formed in said surface a plurality of circumferentially spaced anchoring flaps,

wherein each flap has one side edge connected to the inner circumferential surface of the pilferproof skirt portion and each flap extends radially inwardly from the side edge,

wherein in mounting the closure on the mouth-neck portion, the anchoring flaps pass over the annular anchoring flange by being elastically bent radially outwardly, and when the closure has been fully mounted on the mouth-neck portion, the anchoring flaps which have passed over the annular anchoring flange return elastically, wherein each flap has an upper edge and the annular anchoring flange has an under surface and the upper edges of the anchoring flaps engage the under surface of the annular anchoring flange to hamper the axially upward movement of the pilferproof skirt portion;

a projecting flange formed on the peripheral surface of the mouth-neck portion wherein the flange projects radially outwardly at a position spaced downwardly a predetermined distance from the annular anchoring flange,

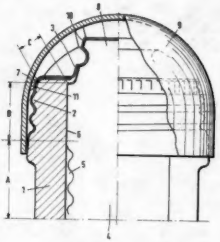
wherein the pilferproof skirt portion has a lower end and the projecting flange has an upper surface with a groove formed thereon, and when the closure has been fully mounted on the mouth-neck portion, the lower end of the pilferproof skirt portion is inserted in the groove on the upper surface of the projecting flange.

4,592,477

CLOSURE CAP FOR CONTAINER UNDER PRESSURE

Heinz Leonhardt, Bedburg, and Otto H. Rhein, Wiesbaden, both of Fed. Rep. of Germany, assignors to Vaw-Folein-Verarbeitung GmbH, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,874
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—334 **9 Claims**



1. A closure for a container of liquid under pressure, the container having an externally threaded bottleneck and an annular bottlemouth, said closure comprising:

a stem having a corrugated lower surface, a middle liquid sealing surface, and a head end, said head end protruding above said bottlemouth when said stem is placed within said bottlemouth; and

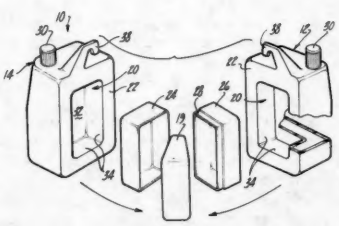
aluminum-containing cap means for engaging said externally threaded bottleneck, said cap means secured to said head end of said stem and said cap means having a plastic coated annular surface for forming a gas seal with the annular surface of said bottlemouth.

4,592,478

CONTAINER ASSEMBLY

Richard Laconis, 419 La Plaza Ct., Royal Oak, Mich. 48073

Filed Oct. 2, 1984, Ser. No. 656,978
Int. Cl.[4] B65D *21/02, 1/04*
U.S. Cl. 220—23.83 **9 Claims**

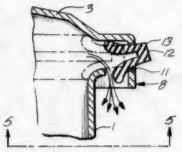


1. A container assembly (10) comprising a pair of liquid container means (12, 14) and soap bar retention means (16), characterized by said retention means (16) being integral with said container means (12, 14) and cooperating together therewith to define a pocket (18) for housing of a bar of soap (19) and frictionally securing said container assembly together.

4,592,479
PRESSURE COOKER HAVING VENT MEANS

Irineu Resende, Sao Paulo, Brazil, assignor to Alcan Aluminio Do Brasil S/A, Sao Paulo, Brazil

Filed Sep. 4, 1984, Ser. No. 647,115
Claims priority, application Brazil, Sep. 22, 1983, 8305177[U]
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—209 2 Claims



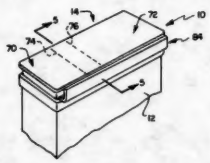
1. In a pressure cooker of the type having a container and a removable lid, a central pressure relief valve and means for coupling the lid to the container including a rim on the container having spaced outwardly projecting rim portions, a downwardly directed lip on the lid including spaced inwardly turned portions each adapted to trap a rim portion when the lid is positioned on and rotated relative to the container, and a resilient sealing ring disposed between the rim and lid, the improvement comprising:

said lid lip is provided with a radially directed aperture disposed between adjacent turned portions and adapted to register with a portion of the sealing ring when the lid is coupled to the container, said sealing ring portion resiliently displaced through the aperture in response to pressure cooker overpressure, said displaced ring portion defining a downwardly directed vent between said lid and adjacent rim portions.

4,592,480
TAMPER EVIDENCING CONTAINER CAPS

James A. Hart, Cockeysville, Md., and R. Keith Jacks, Waukegan, Ill., assignors to SCM Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,737
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 30 Claims



1. A tamper evidencing container cap, comprising:

first and second cover members connected to each other;

mounting means for securely mounting said second cover member to said first cover member to substantially prevent relative movement therebetween;

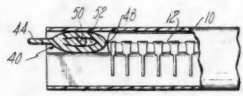
first and second lids hinged to said second cover member; and

tamper evidencing means removably connected to said first and second lids to prevent said lids from opening until said tamper evidencing means is removed.

4,592,481
RESILIENT STOPPER FOR INTEGRATED CIRCUIT MAGAZINE

Charles C. Chen, Houston, Tex., assignor to Thomson Components - Mostek Corporation, Carrollton, Tex.

Filed Aug. 23, 1985, Ser. No. 768,595
Int. Cl.[4] B65D *39/00*
U.S. Cl. 220—307 2 Claims



1. A resilient stopper (40) for retaining IC's (12) in magazine (10) having a rectangular section (16) of height (h) and width (w) comprising:

a tubular body portion (42) of thickness (t), inner diameter (d) and width substantially (w); and

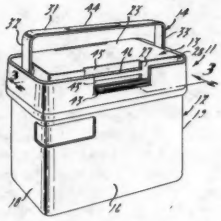
a tab (50) within the stopper of thickness (b) and length (c) extending inwardly from a trailing edge area (46) of the body portion (42);

wherein $2t+b>h$ to effect a positive interference fit of the stopper within the magazine.

4,592,482
HANDLE MECHANISM FOR COOLER OR THE LIKE

Richard H. Seager, Mystic, Conn., assignor to King-Seeley Thermos Co., Norwich, Conn.

Filed Nov. 14, 1980, Ser. No. 207,022
Int. Cl.[4] B65D *25/28, 25/32, 45/04*
U.S. Cl. 220—318 8 Claims

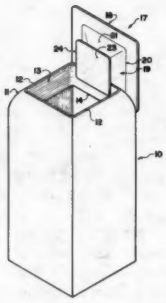


1. A portable cooler assembly comprising a body portion, said body portion having a lower wall and upstanding side walls defining a cavity, said side walls defining an opening to said cavity above said lower wall, said walls being insulated to maintain a desired temperature in said cavity, said side walls defining a generally planar ledge below their upper edges and circumscribing said opening, a lid adapted to be supported directly upon said ledge for closing said opening, a handle supported for pivotal movement by opposing of said walls about a horizontally disposed axis from an upright carrying position to a lowered storage position, said handle having a configuration to nest between the outer peripheral edges of said lid and the inner surfaces of the edges of a portion of said opposing side walls and one of the interconnecting side walls that extend above said ledge when said handle is in its storage position said lid having a locking projection formed thereon extending outwardly therefrom and positioned below the upper edges of said side walls when said lid is supported on said body portion and latch means on said handle adapted to coact with said locking projection when said handle is in at least one of said positions for locking said lid to said body portion.

4,592,483
CONTAINER AND SEPARATE CO-OPERATING LID

Raymond E. Scouten, 145 Montrose St., Winnipeg, Manitoba, Canada (R3M 3L8)

Filed Aug. 6, 1984, Ser. No. 609,353
Int. Cl.[4] B65D 45/00
U.S. Cl. 220—379 2 Claims



1. A container and separate co-operating lid therefor, the container having an open mouth surrounded by a generally upstanding rim of regular polygonal shape defining a plurality of sides and the lid having a top portion of sufficient extent to cover the open mouth when in a closed position and a portion of similar polygonal shape defining a similar plurality of sides on an underside of said top portion projecting therefrom inwardly into said container, said underside portion including a recess arranged in each of the sides thereof such that the lid can pivot relative to the rim from the losed position to an open position in which the lid sits astride the rim with the rim projecting into the recess, each side of said rim having a shape in cross section of an inverted V so as to define an outwardly facing inclined surface and an inwardly facing inclined surface, said recess of each side of said underside portion having a similar V shape so as to define, when sitting astride the rim, a first surface intersecting the top portion which lies in contact with the outwardly facing inclined surface and a second surface intersecting a lowermost edge of said underside portion which lies in contact with said inwardly facing inclined surface whereby said top portion is maintained substantially vertical and such that, when in a closed position, an intersection between the top portion and the first surface substantially engages said rim and an intersection between said second surface and said lowermost edge substantially engages an interior surface of said container whereby to maintain said lid in centered position on said rim.

4,592,484
SEED-SOWING ELEMENT AND DRILL FOR EXPERIMENTAL PLOTS

Jacques Pregermain, Paris, France, assignor to Institut Technique des Cereales et des Fourrages, Paris and Association Generale des Producteurs de Mais, Pau, both of, France

Continuation-in-part of Ser. No. 313,135, Oct. 20, 1981, abandoned. This application Jul. 6, 1984, Ser. No. 628,524
Claims priority, application France, Oct. 29, 1980, 80 23149
Int. Cl.[4] B65G 59/06
U.S. Cl. 221—13 5 Claims

1. A seed-sowing element for experimental plots delimited on a piece of ground, mounted on a drill of the pneumatic type having a turbine and a general low pressure suction producing assembly comprising:

a perforated seed-sowing disk having first and second opposite faces,

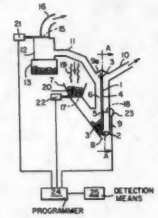
a suction cover connected to a low pressure duct subjecting a majority of the surface of said first face to a low pressure,

a supply chamber opposite said second face for supplying seeds,

a duct connected to a storage hopper for supplying the seeds by gravity to said supply chamber,

an extraction duct connected to said supply chamber,

an excess-seed low pressure recovery assembly connected to said supply chamber and including



a first flap inserted in said extraction duct,

a second flap positioned between an outlet of said storage hopper and said supply chamber,

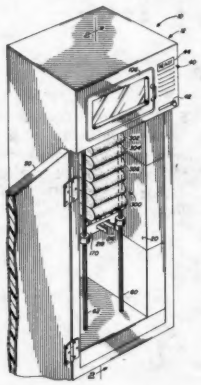
and a third flap positioned in said suction cover so as to cut off low pressure from at least part of the surface of said first face,

said flaps being connected for operation in a cycle.

4,592,485
MEAL VENDING APPARATUS

C. Keith Anderson, Tempe; George C. Vieth, Jr., Avondale; Lane D. Vance, Mesa, and Darwin D. Grant, Scottsdale, all of Ariz., assignors to Meals Incorporated, Phoenix, Ariz.

Filed May 17, 1984, Ser. No. 611,512
Int. Cl.[4] G07F 11/72
U.S. Cl. 221—150 HC 20 Claims



17. Apparatus for heating and dispensing a meal package, comprising, in combination:

refrigerator compartment means for refrigerating the meal package;

platform means movably disposed within the refrigerated compartment means, including a platform adapted to support the meal package;

oven means for receiving the meal package and for heating and dispensing the meal package; and

door means secured to the oven means and movable in a first direction to a first position to open the oven means to receive the meal package and movable in a second direc-

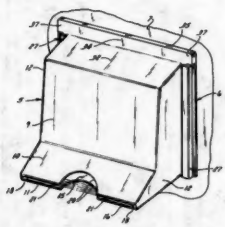
tion to a closed position to upwardly move the meal package into the oven means and to close the oven means.

4,592,486

HOLDER FOR TOOTHPICKS

Martin P. Belokin, Denton, Tex., assignor to Martin Paul, Inc., Denton, Tex.

Filed Sep. 10, 1984, Ser. No. 648,522
Int. Cl.[4] B65H *1/00*
U.S. Cl. 221—283 **5 Claims**



2. A holder for elongated slender articles such as toothpicks from which the articles can be removed one by one, said holder being characterized by:

A. A one-piece receptacle which is open at its rear and which comprises

(1) an upright front wall,

(2) opposite side walls projecting rearward from said front wall and having upright straight and parallel rear edges, each said side wall having an elongated laterally outwardly projecting flange extending lengthwise along its rear edge,

(3) means on a top portion of the receptacle defining a downwardly facing abutment adjacent to an upper end of each of said flanges, and

(4) upper and lower forwardly and downwardly inclined outlet walls, each having a laterally extending front edge which is parallel and vertically adjacent to the front edge of the other and which is spaced forwardly from the plane of said front wall,

(a) the upper outlet wall being connected with the bottom of said front wall,

(b) the lower outlet wall being connected with said side walls and supported by them and having a rear edge which is substantially coplanar with the rear edges of the side walls,

(c) one of said outlet walls having at least a front portion which is detached from the side walls to be flatwise flexible up and down so that said outlet walls normally cooperate to confine a slender article in the receptacle but allow it to be withdrawn forwardly between their front edges, and

(d) each said outlet wall having a forwardly concave bay in its front edge through which an article between the outlet walls is accessible for forward withdrawal; and

B. a one-piece retaining member

(1) having a substantially flat body portion with opposite side edges and opposite top and bottom edges, said body portion being impregnated with magnetic material to be magnetically securable to an upright magnetically permeable supporting surface, and

(2) having elongated rearwardly projecting channel portions extending lengthwise along opposite side edges of its body portion, each defining a groove that opens laterally towards the other channel portion, said channel portions being cooperable with said flanges to connect the receptacle and the retaining member for vertical sliding to and from a position in which said upper edge of the retaining member engages said abutment and at which the retaining member closes the open rear of the receptacle and can support the receptacle.

4,592,487

DENTIFRICES

Gilbert I. Simon, 1111 Midland Ave., Bronxville, N.Y. 10708, and Roy T. Witkin, 23 Broadview Rd., Westport, Conn. 06880

Filed Jul. 3, 1985, Ser. No. 752,236
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.[4] A61K *7/20, 33/18, 31/79*
U.S. Cl. 222—94 **16 Claims**

1. An antimicrobial antiplaque dentifrice comprising, in addition to conventional dentifrice ingredients in usual amounts, about 6%, calculated on the total weight of the dentifrice, of povidone-iodine complex or Biopal as iodophor as a first part and about 2%, on the same basis, of a separate source of active or oxygen such as carbamide peroxide as a second part, whereby during use of the dentifrice the two parts are admixed and provide an effective antimicrobial antiplaque non-toxic amount of iodine derived from the iodophor of the first part, the antimicrobial activity of which is enhanced or potentiated by interaction with the source of oxygen and/or the active or nascent oxygen released therefrom.

4,592,488

METHOD FOR THE PREPARATION OF CHEMOTHERAPEUTIC COMPOSITIONS FOR THE TREATMENT OF PERIODONTAL DISEASE, COMPOSITIONS THEREFOR AND USE THEREOF

Gilbert I. Simon, 111 Midland Ave., Bronxville, N.Y. 10708, and Roy T. Witkin, 23 Broadview Rd., Westport, Conn. 06880

Filed May 24, 1985, Ser. No. 737,469
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.[4] A61K *7/20, 33/18, 31/79*
U.S. Cl. 222—94 **18 Claims**

1. A non-toxic, cosmetically acceptable lavage for the treatment of periodontal disease comprising an antimicrobial agent selected from PVP-I, (nonyl-phenoxypoly (ethyleneoxy) ethanol iodine complex) per MPEP 608.01(V) "Trademarks and names" or cetylpryridinium chloride effective against the microorganisms normally present in the oral cavity admixed with a source of nascent or active oxygen comprising H_2O_2, carbamide peroxide, benzoyl peroxide or sodium peroxycarbonate, the antimicrobial agent and the oxygen source being in predetermined relative amounts and proportions and maintained out of contact with one another until they are to be combined to form the oral lavage or pre-mixed as a stabilized combination, the antimicrobial agent and the oxygen source interacting when the lavage is ready to be used such that the oxygen source leases oxygen to enhance the antimicrobial activity of the antimicrobial agent.

4,592,489

COMPARTMENTED CONTAINER MEANS FOR ANTIMICROBIAL ORAL LAVAGE

Gilbert I. Simon, 1111 Midland Ave, Bronxville, N.Y. 10708, and Roy T. Witkin, 23 Broadview Rd., Westport, Conn. 06330

Division of Ser. No. 565,661, Dec. 30, 1983, Pat. No. 4,521,403, which is a continuation-in-part of Ser. No. 459,525, Jan. 20, 1983, which is a continuation-in-part of Ser. No. 145,590, May 1, 1980, abandoned. This application Mar. 6, 1985, Ser. No. 708,687
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.
Int. Cl.[4] A61K *7/20, 33/18, 31/79*
U.S. Cl. 222—94 **9 Claims**

1. A two-part container having a component of an oral lavage in each of its parts out of contact with one another, one part containing a povidone-iodine complex solution and the

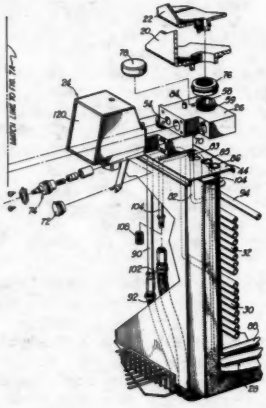
other part containing an aqueous hydrogen peroxide solution, the two container parts upon communication with one another and consequent admixture of the contents thereof forming an antimicrobially active oral lavage effective against microorganisms implicated in diseases of the teeth and periodontium and comprising active iodine derived from the povidone-iodine complex solution by nascent oxygen released from the hydrogen peroxide solution, and which oral lavage, when applied to the teeth and periodontium acting to enhance the reduction of the spectrum and amount of microbial growth in the mouth.

4,592,490

BEVERAGE DISPENSER SYSTEM CONVERTABLE BETWEEN GRAVITY AND PRESSURE

Dannie L. McMichael, Unionville, Conn., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 24, 1984, Ser. No. 583,480
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—129.1 **22 Claims**



1. A beverage dispenser comprising:

(a) a syrup tube having an inlet opening and an outlet opening;

(b) a water tube having an inlet opening and an outlet opening;

(c) a manifold having a first syrup passageway therethrough having a syrup inlet port and a syrup outlet port, and having a second syrup passageway therethrough having a syrup inlet port and a syrup outlet port;

(d) said syrup tube being connected to said manifold with said syrup tube inlet opening being connected to said syrup outlet port of said first syrup passageway and with said syrup tube outlet opening being connected to said syrup inlet port of said second syrup passageway;

(e) a syrup inlet pipe connected at one end thereof to said syrup tube and having a removable cap at the other end thereof;

(f) said syrup inlet port of said first syrup passageway having means for connecting thereto one of a syrup gravity tank or a cover; and

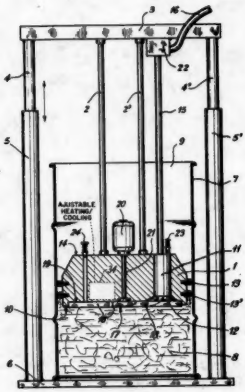
(g) said water tube outlet opening being located adjacent to said outlet port of said second syrup passageway, whereby a dispensing valve having a water inlet port and a syrup inlet port can be connected to said water outlet opening and to said outlet port of said second syrup passageway, respectively.

4,592,491

DEVICE FOR EMPTYING RECIPIENTS CONTAINING PRODUCTS OF HIGH VISCOSITY

Gérard Chollet, Chelles-Les-Coudreaux, France, assignor to Fraco S.A., Seine-et-Marne, France

Filed Aug. 14, 1984, Ser. No. 640,699
Claims priority, application France, Aug. 17, 1983, 83 13371
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—146.5 **9 Claims**



1. In a device for emptying a recipient containing a product of high viscosity, comprising means for introducing a plate, whose dimensions correspond substantially to those of the opening of the recipient, into said recipient, means for pumping this product, fast with the plate and having a withdrawal zone opening out on the frontal face of the plate in contact with the product, as well as adjustable means for heating and cooling the plate,

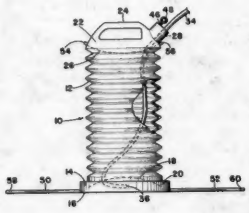
said plate comprises a scraper system disposed in the vicinity of the frontal face, the scraper system being set in motion by means of a drive system so as to bring the product adjacent the frontal face towards the withdrawal zone.

4,592,492

BELLOWS-TYPE CONTAINER FOR LIQUIDS

Richard D. Tidmore, Rte. 2, Box 777, Ft. Gibson, Okla. 74434

Filed Apr. 8, 1982, Ser. No. 366,430
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—209 **4 Claims**



1. A container for transferring liquids from one reservoir to another comprising:

a cylindrical vessel having a bellows-type cylindrical wall and a top and bottom end, the bottom end being closed and the top end having a valve opening and a tube opening therein, the valve opening being defined by an internal chamber having a reduced diameter upper and a reduced

diameter lower opening, the lower opening communicating with the interior of the vessel and the upper opening communicating with the vessel exterior;

a ball received in said valve opening chamber, the ball being of external diameter less than the internal diameter of said valve opening chamber and larger than said upper and lower openings;

an elongated stem affixed at one end to said ball and extending externally of said vessel through said reduced diameter upper opening, the stem being of diameter less than said upper opening, the stem being of small weight and size so as not to interfere with the normal propensity of the ball to automatically seal against said upper and lower openings as moved by the force of air or fluid tending to flow through said valve opening but affording means whereby the ball can be manually positioned to let air in or out of the vessel as desired; and

a tube sealably received in said tube opening, one end of the tube being adjacent the interior bottom of the vessel and the other end being spaced a distance from the vessel exterior and adapted to extend within another vessel as the container is used.

4,592,493

RECLOSABLE DISPENSER

Robert C. Smith, Short Hills, N.J., assignor to Unette Corporation, Parsippany, N.J.

Filed Oct. 15, 1984, Ser. No. 661,115
Int. Cl.[4] B65D *37/00, 5/72;* F16K *31/00*
U.S. Cl. 222—212 **9 Claims**

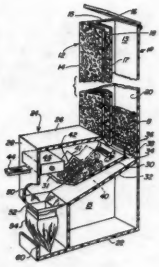
1. A reclosable article for containing and dispensing a fluent material comprising a tubular container for containing a fluent material, the side walls of said container at one end thereof having substantially equal thickness and being compressed against themselves with substantial portions of the confronting interior surfaces of said side walls being sealed together to define a generally flat sealed end closing said one end of said container, and having a blind unsealed passageway between said sealed surfaces communicating with the interior of said container and extending into and terminating within said sealed end, valve means between said sealed surfaces and intersecting said passageway and including a pair of aligned, confronting and unsealed, respectively indented and distended wall portions forming a bubble projecting on one side of said sealed end and a corresponding dimple on the other side of said sealed end defining a closed position of said valve, said distended wall portion being disposed on one side of said end and said indented wall portion being disposed on the other side of said end, said confronting wall portions being flexible upon finger pressure being applied thereto to move said valve alternately between its said valve-closed position in which said bubble projects on said one side of said sealed end and a valve-opened position in which said bubble projects fully on said other side of said sealed end and a corresponding dimple is formed on said one side of said end, said confronting wall portions being similarly configured with said distended wall portion having a curvature which is greater than that of said indented wall portion whereby when said wall portions are in said valve-opened position a space is formed between said curvatures of said confronting wall portions communicating through said passageway and whereby when said confronting wall portions are in said valve-closed position said wall portions press against each other to close communication through said passageway.

4,592,494

SEALED BARRIER CONTAINER

John P. Ellis, and Chris P. Ellis, both of 209 Lincoln Mall Shopping Center, Matteson, Ill. 60443

Filed Feb. 19, 1985, Ser. No. 702,628
Int. Cl.[4] G01F *13/00*
U.S. Cl. 222—252 **16 Claims**



1. A sealed barrier container providing limited access to the interior confines of the container and adapted to contain a supply of bulk product for metered dispensing therefrom, comprising in combination,

an enclosed container having an upper portion, a base for supporting said container, and a dispensing portion positioned intermediate therebetween,

said upper portion having a bulk product hopper for containing a supply of bulk product, said hopper being formed by opposed side walls, a front wall and a rear wall,

said hopper provided with an access panel movable between an access position and a closed position,

a dispensing portion positioned in operative relation with respect to said hopper,

said dispensing portion including a product ramp in communication with said hopper and extending outwardly therefrom to an exit chute,

scoop means in operative relationship with said ramp and reciprocable with respect to said ramp and said chute,

said scoop means including external control means associated therewith and positioned externally with respect to said dispensing portion of said container whereby said control means may be manipulated externally to control and reciprocate said scoop means within said container to dispense product from said ramp to said exit chute,

an individualized product receptacle means adapted for disengageable engagement with said exit chute,

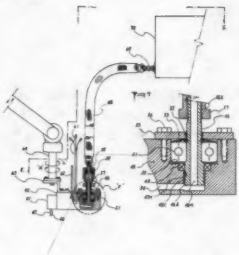
whereby product contained within said hopper may be dispensed onto said product ramp and said scoop means manipulated by said external control means to dispense product from said ramp into said product receptacle via said exit chute, and said product receptacle disengaged from said exit chute to accommodate the removal of said product from said sealed container.

4,592,495

AUTOMATIC GUN FOR DISCHARGING THERMOPLASTIC RESIN

Masaaki Toda, Kawasaki, and Yoshio Ichikawa, Yokohama, both of Japan, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 16, 1982, Ser. No. 450,260
Claims priority, application Japan, Dec. 29, 1981, 56-215170
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—526 6 Claims



1. An automatic fluid dispenser mounted to a mover for dispensing fluid received from a hose, the dispenser comprising a gun block, rotatable by said mover about an axis, a nozzle means for dispensing fluid and mounted to said gun block on said axis, a spindle rotatably mounted to said gun block and disposed parallel to said axis, said spindle and gun block placing the hose and nozzle means in fluid communication; said spindle connected to the hose so that said gun block rotates relative to the hose, and means for mounting said gun block to the mover.

4,592,496

GARMENT PATTERN FORM

Beatrice Y. Nishi, 161 7th Ave., San Francisco, Calif. 94118

Continuation of Ser. No. 547,502, Oct. 31, 1983, abandoned.
This application Jul. 16, 1985, Ser. No. 757,181
Int. Cl.[4] A41H *5/00*
U.S. Cl. 223—68 18 Claims

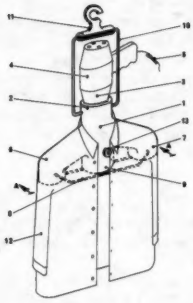
1. A garment pattern form comprising: an upright post; first, second, third and fourth adjustable members shiftably mounted on the post, each member being spaced from and adjustable on the post independently of the other members and having means thereon for releasably securing the member to the post, the first member representing the shoulder region, the second member representing the bust region, the third member representing the waist region, and the fourth member representing the hip region, said members presenting outer surfaces; and flexible means removably mounted on the outer surfaces of the members for presenting surface portions on which tissue paper patterns can be mounted.

4,592,497

HEATING COAT-HANGER FOR GARMENTS

Fournier Georges, 8 rue de l'Aubepine, 42230 Roche la Moliere, France

Filed Mar. 12, 1984, Ser. No. 588,896
Claims priority, application France, Mar. 14, 1983, 83 04526
Int. Cl.[4] A41H *5/00*; A41D *27/22*
U.S. Cl. 223—69 18 Claims



1. A coat-hanger for garments for use in combination with an appliance producing a flow of hot air comprising:

a central neck comprising a central duct passing therethrough, said central neck adapted to receive said appliance to produce a hot air flow in said central duct; said central neck further comprising a lower portion having a lower opening for venting said central duct below said coat-hanger; and

a pair of lateral branches connected to said central neck above said lower portion of central neck; each of said pair of lateral branches comprising a lateral duct in communication with said central duct and further comprising at least one opening venting said lateral duct external to said pair of lateral branches.

4,592,498

SURGICAL STAPLER

Karl Braun, Talheim, and Jürgen Fetzer, Gerstetten-Dettingen, both of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Division of Ser. No. 465,354, Feb. 9, 1983, Pat. No. 4,523,695.
This application Mar. 13, 1985, Ser. No. 711,381
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204522
Int. Cl.[4] A61B *17/00*
U.S. Cl. 227—19 20 Claims

1. A surgical stapler, comprising:

a front housing portion;

a staple channel, disposed longitudinally in said front housing portion;

a staple magazine, disposed in said front housing portion, said staple channel having an opening communicating with said staple magazine,

means, disposed in said front housing portion, for advancing staples in said staple magazine and delivering them to said staple channel;

an anvil surface, disposed at a front end of said staple channel;

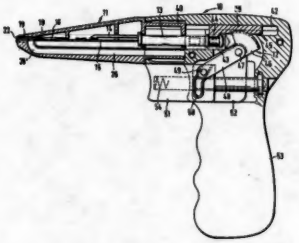
a driver, having an actuating and a retracted position, movably disposed in said staple channel, for deforming a staple in cooperation with said anvil surface, in said actuating position;

a rear housing portion;

a handle, coupled to said rear housing portion, having a recess therein having a longitudinal axis disposed substantially parallel to said staple channel;

a trigger, having an inoperative and an actuated position, guided in said recess of said handle for movement along said longitudinal axis of said recess, having a transverse slot therein;

means, disposed in said handle, for urging said trigger outwardly of said handle;



a lever, having a first and a second arm, pivotally coupled between said first and second arms to said rear housing portion;

means, coupled to said first arm of said lever and said trigger, for constraining an end of said first arm to move along said slot in said trigger; and,

means, coupled to said second arm, for moving said driver in said channel.

4,592,499

APPARATUS FOR DISPENSING FASTENERS

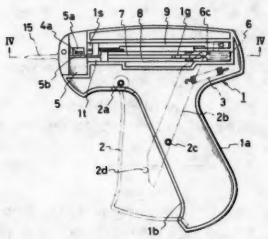
Masami Kato, Nagoya, Japan, assignor to Toska Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 680,122

Claims priority, application Japan, Apr. 12, 1984, 59-71729

Int. Cl.[4] B65C *5/06*

U.S. Cl. 227—67 **6 Claims**



1. Apparatus for applying fasteners (P) to articles by passing each fastener (P) severed from a fastener assembly (Pa) through a hollow needle (15), said fastener assembly comprising a plurality of fasteners and means for connecting the fasteners together, each fastener having a cross bar section, said apparatus comprising:

an alignment passage (14) in which the fastener assembly (Pa) is loaded,

a guide slot (5*b*) located at and in communication with a bottom end portion of the alignment passage (14),

feed means (20) comprising a feed blade (4) engageable with a cross bar section (B) of the fastener (P), a feed blade driving rod (7) for releasing engagement between the cross bar section (B) of the fastener (P) and the feed blade (4), and a feed-blade displacement rod (9) for retracting the feed blade (4) toward an open top end of the alignment passage (14),

a force rod (8) adapted to sever fasteners (P) individually successively from the fastener assembly (Pa) while forcing the fastener (P) being severed in the longitudinal direction thereof and to push the cross bar section (B) of each severed fastener (P) into a guide passage (6*d*) located on the axis of the hollow needle (15), and

a piston (6) having a piston rod (6*a*) for pushing out of a leading end of the hollow needle (15) the cross bar section (B) of the fastener (P) placed in the guide passage (6*d*).

4,592,500

TAG-PIN DISPENSING MACHINE

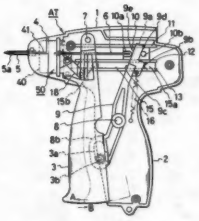
Masami Kato, Nagoya, Japan, assignor to Toska Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 700,949

Claims priority, application Japan, Jul. 17, 1984, 59-146745

Int. Cl.[4] B65L *5/06*

U.S. Cl. 227—67 **8 Claims**



1. A tag-pin dispensing machine comprising a machine body (1), a feeder unit (50) removably mounted in the machine body (1) for individually successively severing tag pins p of a tag-pin assembly P comprising a number of tag pins p having their crossbars b connected to one another, and delivering each severed tag pin p to the prescribed position corresponding within the machine body (1) to the open tail end of a hollow needle (5) mounted in a nose end portion of the machine body (1), and a shifter (15) driven by a trigger (3) pivotally secured to the machine body (1), said feeder unit (50) and said shifter (15) being connected toether by a connecting member (18), said feeder unit (50) comprising a housing (25) and feeding means (19) assembled in the housing (25), said feeding means (19) comprising a cutter element (29) for individually successively severing tag pins p from the tag-pin assembly P and delivering each severed tag-pin p to the prescribed position corresponding within the machine body (1) to the open tail end of the hollow needle (5), said feeder unit (50) being structured so as to enable removal of said feeder unit (50) as an integral assembly from said machine body (1) and said connecting member (18).

4,592,501

BUTTON ORIENTATION APPARATUS

Toshiaki Sodeno, Toyama, and Yukio Taga, Uozu, both of Japan, assignors to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,752

Claims priority, application Japan, Nov. 4, 1983, 58-171118[U]

Int. Cl.[4] A41H *37/10*

U.S. Cl. 227—119 **7 Claims**

1. A button orientation apparatus which comprises:

(a) a support frame;

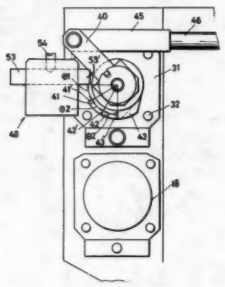
(b) a setting die secured to said support for receiving a button thereon;

(c) a finger holder rotatably and axially movably mounted on said setting die and having at its upper end a pair of

clamping fingers for clamping the button on said setting die and having on its lower periphery a ring gear for rotating the finger holder;

(d) a shaft holder secured to said frame;

(e) a rotary shaft journaled in said shaft holder for rotation and having at its upper end a sector gear in meshing engagement with said ring gear;



(f) a cam assembly rotatively connected to the lower end of said shaft and having a plurality of cam plates in juxtaposed relation;

(g) a pin holder secured to said shaft holder and having a plurality of apertures registering in position respectively with said cam plates and a stopper pin releasably received in one of said apertures; and

(h) a cylinder and piston drive for driving said rotary shaft.

4,592,502

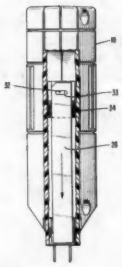
OFFSET ELECTRIC STAPLER

Alfred H. Judge, Raleigh, N.C., assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 5, 1984, Ser. No. 667,976

Int. Cl.[4] B25C *5/15*

U.S. Cl. 227—131 **8 Claims**



1. An electric stapler having a housing containing a staple driving mechanism, a switch means and a staple magazine, said staple driving mechanism comprising: a cylindrical coil electrically connected to said switch means, said coil being disposed around a smooth axial bore; an armature disposed to move co-axially within said bore when said coil is activated; spring means biasing said armature axially away from said coil; an offset link affixed to the upper end of said armature; an elongated staple-engaging member having a staple-engaging end and a driven end, said member being generally parallel to the axis of said coil, said driven end being affixed to said offset link by means of a pin projecting from said offset link engaging a hole in the driven end of said staple engaging member, said hole in said staple engaging member being larger than said pin thereby allowing said staple engaging member to move somewhat with respect to said pin and said offset link; wherein axial movement of said armature is guided by the interior surface of said bore.

4,592,503

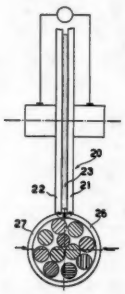
CONTINUOUS METHOD FOR MANUFACTURING THERMIC LANCES

Jean-Pierre Castelain, Rue Ribera 58, B-7200 Colfontaine, Belgium

Filed Oct. 17, 1983, Ser. No. 542,744

Int. Cl.[4] B23K *11/06*

U.S. Cl. 228—147 **5 Claims**



1. A continuous method of manufacturing thermic lances, said method comprised of the following steps:

successively passing a metallic strip in different shaping frames to obtain a profile having a section which is approximately U-shaped;

undulating, crimping or twisting one or more wires forming the filling around one or more central wires;

introducing the wires forming the filling in the U-shaped profile in order to shape a tube;

welding the tube by low frequency using a seam welding wheel, the profile being simultaneously submitted to an outer deformation which brings together both edges of the U-shaped profile, the outer deformation which is applied to close the tube flattening the wires of filling, the applied deformation being less than the elastic stress limit of said wires;

passing the filled tube through one or more finishing frames; and

subsequently plunging the filled tube in a passivating bath to provide protection against oxidation by atmospheric agents.

4,592,504

HOT-WATER STORAGE TYPE HOT-WATER SUPPLY APPARATUS OPERATING UNDER A NATURAL CIRCULATION PRINCIPLE

Tadashi Yoshida, Nakatsugawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 233,615

Int. Cl.[4] F22B *1/02*

U.S. Cl. 237—19 **3 Claims**

1. A hot water storage type hot water supply apparatus operating by the principle of natural circulation, said apparatus comprising:

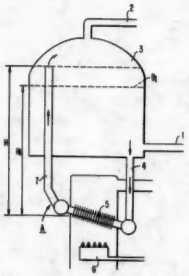
a hot water storage tank for storing hot water therein and from which hot water may be dispensed;

a hot water circulation passage having a first end connected to the bottom of said storage tank and a second end located at an upper position within said storage tank;

a heat exchanger disposed between said first and second ends of said passage, whereby water from said storage tank

enters said first end of said passage and is heated therein by said heat exchanger, and the thus obtained hot water passes from said second end of said passage into said storage tank and is accumulated therein from an upper portion thereof to a lower portion thereof; and

means for maintaining substantially constant the temperature of said hot water passing from said second end of said



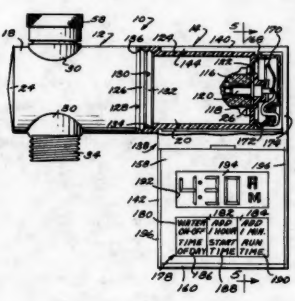
passage into said storage tank, said maintaining means comprising thermal valve means, positioned in said passage at a location downstream of said heat exchanger, for increasing the opening area of said passage when the temperature of said hot water becomes relatively high and for decreasing said opening area when the temperature of said hot water becomes relatively low.

4,592,505

QUICK DISCONNECT MOUNTED PROGRAMMING MEANS FOR SPRINKLER

Kenneth J. Bruninga, Mapleton, and Douglas C. Fletcher, Peoria, both of Ill., assignors to L. R. Nelson Corporation, Peoria, Ill.

Filed Jan. 30, 1984, Ser. No. 575,012
Int. Cl.[4] A01G *27/00*
U.S. Cl. 239—69 **17 Claims**



1. Apparatus for connection with a sill cock for communicating water under pressure from the sill cock with a hose having a lawn sprinkler communicating therewith comprising

a female coupler for connection with the sili cock,

a male coupler for connection with the hose,

valve means between said couplers movable into opened and closed positions with respect thereto so as to permit and prevent respectively communication of the water under pressure from the sill cock when said female coupler is connected therewith with the hose when said male coupler is connected therewith,

battery means for providing a source of electrical current,

battery operated valve moving means operable in response to the connection of the electric current from said battery means therewith for effecting movement of said valve means from its closed position into its opened position,

battery operated programming means for selecting a sprinkling time in the future when it is desired to water with the sprinkler,

battery operated display means for displaying the sprinkling time selected by said programming means,

a first water control unit including a fixed housing structure containing said male coupler, said valve means, said battery operated valve moving means and said female coupler so as to render said first unit operable to be fixed to the sill cock in supported relation thereby when said female coupler is connected therewith,

a manually portable programming unit including a portable housing structure containing said battery operated programming means, said battery operated display means, and said battery means operatively connected with said battery operated programming means and said battery operated display means,

mounting means operatively associated with both of said units for interengagement to mount said portable unit in supported relation on said fixed first unit in an operative position and for disengagement to enable the portable unit to be disposed in a remote position with respect to said fixed first unit such that a user can operate said programming means remote from said fixed first unit allowing for observation of said display means at close eye-level proximity, and

means operable when said portable unit is mounted on said fixed first unit in said operative position to connect an electrical current from said battery means contained in said portable unit with said battery operated valve moving means contained in said fixed first unit when the sprinkler time selected on said programming means arrives causing said valve means to be moved into its opened position and water under pressure from the sill cock connected with said female coupler to flow into the hose connected with said male coupler,

said mounting means comprising a tubular supporting portion of said fixed housing structure and a tubular supported portion of said portable housing structure, said tubular supported portion being open at one end so as to permit the same to be moved through a docking movement in the direction of said open end with respect to said supporting portion in order to dispose said portable unit in supported relation on said fixed first unit in said operative position,

said supporting and supported portions including (1) guiding surface means for guiding said supported portion in telescoping relation over said supporting portion during an initial portion of said docking movement and (2) sliding surface means for restricting a final portion of the docking movement to a substantial rectilinear movement,

said electrical current connecting means including cooperating male and female electrical connectors interengageable during a final section of the final portion of said docking movement.

4,592,506

WEAR RESISTANT ATOMIZING NOZZLE ASSEMBLY

Charles E. Capes; Adam J. Bennett, both of Ottawa; Kevin A. Jonasson, Orelans, and William L. Thayer, Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 21, 1984, Ser. No. 685,145
Claims priority, application Canada, Jan. 4, 1984, 444624
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—139 **4 Claims**

1. A wear resistant, atomizing nozzle assembly comprising:

(a) an outwardly diverging, frustum of a cone shaped, de-

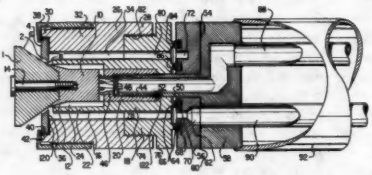
flector core of a wear resistant ceramic material, said deflector core having an outwardly diverging surface, an outer portion of the diverging surface of the deflector core forming an outwardly deflecting surface for a liquid-to-be-atomized,

(b) a nozzle rim of a wear resistant ceramic material, the rim having an inward protrusion with outwardly flared inner surface encircling the diverging surface of the deflector core to form therewith a flared, atomizing nozzle orifice,

(c) a deflector core holder having a flared socket at a leading end, the flared socket having an inner portion of the deflector core closely fitting and aligned therein, the flared socket, in operation, guiding atomizing fluid towards and along the outwardly deflecting surface of the deflector core,

(d) securing means securing the deflector core in the flared socket,

(e) an inner sleeve having an inner end closely fitted on an inner end of the deflector core holder and having a leading, lengthwise extending end portion with an enlarged bore and terminating at an intermediate position along the



length of the flared socket to form a fluid passage around the deflector core holder for, in operation, directing a jet of atomizing fluid along the outer surface of the flared socket and towards and along the outwardly deflecting surface of the deflector core,

(f) an outer sleeve mounted at a rear end of the inner sleeve and having a stepped, annular recessed portion at the leading end with the nozzle rim mounted therein and protruding radially inwardly therefrom, a portion of the outer sleeve member having a relatively larger bore diameter than the outside diameter of the inner sleeve and forming therewith a liquid-to-be-atomized passage thereabout, for, in operation, conveying liquid-to-be-atomized towards an inner side face of, and inwardly around, the inward protrusion of the nozzle rim,

(g) means securing the nozzle rim in the stepped, annular recess,

(h) means for delivering atomizing fluid to the fluid passage, and

(i) means for delivering liquid-to-be-atomized to the liquid-to-be-atomized passage.

4,592,507

APPARATUS AND METHOD FOR PRODUCING AND UNIFORMLY APPLYING FOAMED BITUMINOUS BINDERS TO ROAD SURFACES

Charles R. Benedict, 320 Northview Rd., Dayton, Ohio 45419

Continuation of Ser. No. 538,973, Oct. 5, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,089

Int. Cl.[4] E01C *19/16*

U.S. Cl. 239—172 **5 Claims**

1. Apparatus for coating a road surface with 100% bituminous binder material, the apparatus being of the type which includes a vehicle which travels over the road surface and in which a source of bituminous binder material in a fluid state is carried by the vehicle and in which a source of pressurized gas is carried by the vehicle, the vehicle having a forwardly and rearwardly extending longitudinal axis, the improvement comprising:

a first substantially horizontal fluid conduit carried by the vehicle, the first horizontal fluid conduit being transverse to the longitudinal axis of the vehicle and being positioned in spaced relationship above the road surface, a second substantially horizontal fluid conduit carried by the vehicle, the second horizontal fluid conduit being transverse to the longitudinal axis of the vehicle and being positioned in spaced relationship above the road surface,

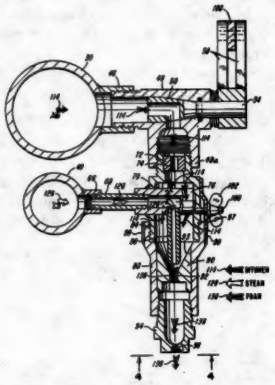
means joining the first fluid conduit to the source of bituminous binder material for fluid flow from the source of bituminous binder material to the first fluid conduit,

means joining the second fluid conduit to the source of pressurized gas for fluid flow from the source of pressuried gas to the second fluid conduit,

a plurality of mixer housings positioned adjacent the road surface, Docket **268**

a plurality of first fluid connector members, there being one first fluid connector member joining each of the mixer housings to the first fluid conduit for fluid flow between the first fluid conduit and the respective mixer housing, a plurality of second fluid connector members, there being one second fluid connector member joining each mixer housing to the second fluid conduit for fluid flow between the respective mixer housing and the second fluid conduit,

a plurality of director caps, each director cap having an upper part and a lower part, the upper part of each director cap being adjustably attached to one of the mixer



housings in communication therewith as the director cap extends from the mixer housing, each director cap being provided with a throat portion having a downwardly directed outlet passage with gradually decreasing dimensions,

a plurality of tubes, there being a tube fixedly positioned within each mixer housing and extending into the director cap which is adjustably attached thereto, the tube having an end portion within the throat portion of the director cap which is adjustably attached to the respective mixer housing, each tube being connected to the respective second fluid connector member for fluid flow from the second connector member and to the tube,

a plurality of nozzle members, there being one nozzle member adjustably attached to each director cap and at the lower part of each director cap, each nozzle member having a discharge opening which is directed downwardly and in alignment with the outlet passage of the throat portion of its respective director cap,

a plurality of securing members, there being one securing member attached to each mixer housing and engageable with the director cap which is adjustably attached to the mixer housing, each securing member being engageable with its respective director cap to retain the respective

director cap in the adjusted position thereof with respect to the mixer housing,

wherein bituminous binder material flows into the mixer housing from the first fluid conduit and wherein pressurized gas flows into the mixer housing from the second fluid conduit, the bituminous material and the gas being mixed within the mixer housing to form a foam, the foam flowing downwardly through the throat portion of the director cap and through the nozzle member and to the road surface,

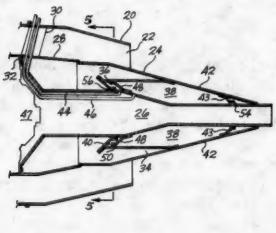
the director cap being adjustable with respect to the mixer housing to adjust the position of the throat portion of the director cap with respect to the tube to adjust the characteristics of foam flowing from the nozzle member.

4,592,508

TRANSLATING JET ENGINE NOZZLE PLUG

Russel L. Thornock, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 27, 1983, Ser. No. 563,419
Int. Cl.[4] F02K 1/50
U.S. Cl. 239—265.19 **25 Claims**



1. Apparatus for varying the cross-sectional area of a flow path in an exhaust nozzle of a power device, comprising:

a nozzle plug having a sliding portion, and a fixed portion; said sliding portion including an axial opening; said fixed portion including a center axial support beam which projects into said opening, on which said sliding portion slides, and which has radially outer surface portions; said sliding and fixed portions together defining first and second expansible chambers radially between said sliding portion and said beam; and each of said chambers being partially defined by said outer surface portions of said beam;

means for mounting said beam to the power device, to support the plug in position at least partially within the exhaust nozzle; and

first and second operating means for introducing fluid pressure into said first and second expansible chambers, respectively, to act against said sliding portion and cause said sliding portion to slide axially inwardly and outwardly, respectively, with respect to the nozzle;

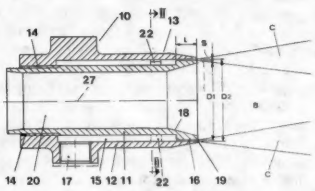
said sliding portion being shaped so that the cross-sectional area of the plug, at each axial station along at least a portion of the axial length of the plug, changes when the sliding portion slides axially, to change the cross-sectional area of an adjacent portion of the nozzle flow path.

4,592,509

BLOWING NOZZLE FOR SILENT OUTFLOW OF GAS

Hans Moss, Blåsvädersg. 6, Göteborg, Sweden (417 32)

PCT No. PCT/SE82/00388, § 371 Date Jul. 6, 1983, § 102(e) Date Jul. 6, 1983, PCT Pub. No. WO83/01747, PCT Pub. Date May 26, 1983
PCT Filed Nov. 17, 1982, Ser. No. 530,595
Claims priority, application Sweden, Nov. 18, 1981, 8106856
Int. Cl.[4] B05B 7/06
U.S. Cl. 239—424 **18 Claims**



1. A nozzle for a blowing device comprising:

an inner hollow cylindrical member;

an outer hollow cylindrical member at least partly surrounding said inner cylindrical member to form a nozzle at one end of said cylindrical members;

an open supply channel between said cylindrical members having an outlet with inner and outer circumferences at said nozzle end for compressed air supplied to said channel to produce a jet of air in the form of at least a part of a ring under adiabatic expansion;

a source of compressed air connectable to said supply channel;

at least one communication channel in said inner hollow cylindrical member having two ends open to the atmosphere, one of said ends comprising an outlet substantially concentrically surrounded by said supply channel outlet and operatively associated therewith to connect the inside of said jet with the atmosphere; and

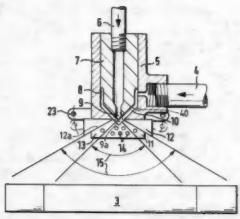
the product of the ratio of the sum of the inner and outer circumferences of said supply channel outlet to the cross-sectional area of said supply channel area and the ratio of the inner diameter to the width of said supply channel outlet being larger than 4 mm/mm^2.

4,592,510

APPARATUS FOR SPRAYING A PROPELLANT-COOLANT MIXTURE UPON A CONTINUOUSLY CAST STRAND

Horst Grothe, Kaarst, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,424
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239042
Int. Cl.[4] B22D 11/124
U.S. Cl. 239—432 **7 Claims**



1. An apparatus for spraying a mixture of a gaseous propel-

lant and a liquid cooling agent onto a strand, especially a steel slab, cast in a continuous casting mold, comprising:

a propellant supply line;

a cooling agent supply line;

a spray nozzle containing a spray nozzle opening;

said propellant supply line and cooling agent supply line cooperating with said spray nozzle;

a narrow mixing chamber defining an apex region;

said narrow mixing chamber being arranged so as to extend transversely relative to the strand and laterally opening at an adjustable angle towards said strand;

said spray nozzle opening flow-communicating with said cooling agent supply line and being arranged approximately at said apex region of said mixing chamber;

said spray nozzle, when in operation, discharging a liquid cooling agent jet through said spray nozzle opening; and

said spray nozzle being provided with means cooperating with said propellant supply line for directing the gaseous propellant at an acute angle and from a number of sides towards said liquid cooling agent jet discharged from said spray nozzle opening in order to thereby form a spray curtain covering substantially the width of said strand.

4,592,511

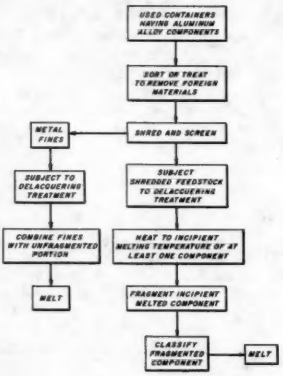
METHOD OF SEGREGATING METALLIC COMPONENTS AND REMOVING FINES THEREFROM

Kenneth A. Bowman, Spring Church, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 446,194, Dec. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 413,515, Aug. 31, 1982, Pat. No. 4,468,847. This application Mar. 20, 1985, Ser. No. 714,053

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—14 **13 Claims**


USED CONTAINERS HAVING ALUMINUM ALLOY COMPONENTS
SORT OR TREAT TO REMOVE FOREIGN MATERIALS
METAL FINES
SHRED AND SCREEN
SUBJECT TO DELACQUERING TREATMENT
SUBJECT SHREDDED FEEDSTOCK TO DELACQUERING TREATMENT
COMBINE FINES WITH UNFRAGMENTED PORTION
HEAT TO INCIPIENT MELTING TEMPERATURE OF AT LEAST ONE COMPONENT
MELT
FRAGMENT INCIPIENT MELTED COMPONENT
CLASSIFY FRAGMENTED COMPONENT
MELT

1. In a process of fragmenting and segregating shredded metallic components fabricated from different aluminum alloys in which a fragmented component is provided, a method of removing fines for purposes of enhancing segregation of the alloys, the method comprising the steps of:

(a) providing a feedstock comprised of said metallic components, said alloys having different incipient melting temperatures;

(b) shredding said feedstock;

(c) screening said shredded feedstock to remove therefrom aluminum alloy fines generated during said shredding step, the fines having at least sizes in a size range of the fragmented component;

(d) heating the feedstock to effect incipient melting of the component having the lower incipient melting temperature;

(e) agitating said heated feedstock sufficiently to cause said component having the lower incipient melting temperature to fragment; and

(f) segregating said fragmented components from the unfragmented feedstock.

4,592,512

METHOD AND APPARATUS FOR THE COMMON GRINDING OF TWO OR MORE BRITTLE MATERIALS HAVING DIFFERENT GRINDING PROPERTIES

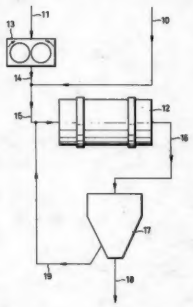
Wolfgang Grigel, Lohmar; Hans Kellerwessel, Aachen, and Raimund Zisselmar, Erftstadt, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,567

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314103

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—24 **5 Claims**



1. A method of making cement which comprises the steps:

pregrinding a quantity of granulated blast furnace slag by roller grinding the same in a roller grinder to which it is supplied in such large quantity that it is drawn between the rollers, forcing them apart and causing the particles to mutually crush one another,

mixing the preground slag with a larger quantity of portland cement clinker,

and grinding the mixture together in a ball mill to produce a mixed cement.

4,592,513

PULPER DEVICE

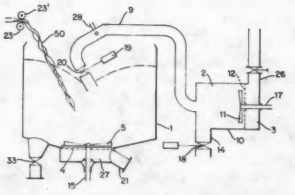
Walter Musselmann; Theodor Bähr, and Helmut Thumm, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,126

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3238589; Nov. 5, 1982, 3240828

Int. Cl.[4] B02C *23/38*

U.S. Cl. 241—46.17 **16 Claims**



1. A pressureless arrangement for disintegrating a water paper suspension, said arrangement including a pressureless

pulper device including means for generating a center core of turbulene therein; a substantially pressureless comminuting apparatus having a center core of turbulence therein and connected directly to and located downstream of said pulper device; and conduit means being positioned in relative close proximity to the cores of tubulence in said pulper device and in said comminuting apparatus and directly connecting said pulper device to said comminuting apparatus through an entry opening in said comminuting apparatus, said apparatus including a disintegrating rotor wheel adapted to produce in said apparatus a turbulence, the axis of rotation of which is generally concentric to said entry opening, wherein said comminuting apparatus includes a sieve positioned substantially perpendicular to the axis of rotation of the said rotor wheel which divides the interior of said apparatus into a disintegrating compartment and a discharge compartment and wherein a useful fraction discharge pipe is connected to said discharge compartment and a reject discharge pipe is connected to said disintegrating compartment, said two discharge pipes including shut-off valves for controlling same.

4,592,514

FIELD CHOPPER WITH ADJUSTABLE FAN ASSIST

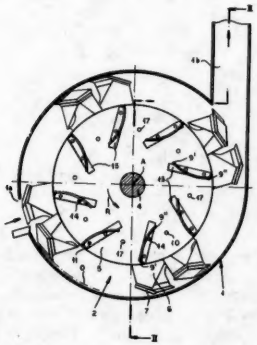
Günter John; Karl-Heinz Kretschmer, both of Neustadt; Horst Schumacher, Langburkersdorf, and Jürgen Röllich, Ehrenberg, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt-Landmaschinen, Neustadt, German Democratic Rep.

Filed Jul. 11, 1984, Ser. No. 629,679

Claims priority, application German Democratic Rep., Jul. 11, 1983, 2529387

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—55 **8 Claims**



1. A chopper comprising:

a housing centered on an axis and having a radially open input and a radially open output spaced angularly therefrom as well as a pair of axially oppositely open intakes;

a cutter drum rotatable in the housing about the axis and having

a pair of end plates transverse of the axis and having axially oppositely directed faces confronting the respective intakes, and

a plurality of blades secured to and between the end plates and having cutting edges defining on rotation of the drum an orbit centered on the axis;

respective pluralities of vanes at the end plates;

means for securing the vanes to the respective end plates in in-service positions extending generally radially thereon so that rotation of the drum moves the vanes to draw air in the axial intakes and expel it through the radial output and for alternately securing the vanes in an out-of-service position also secured to the respective end plates but extending generally only angularly, whereby in the out-of-service position the vanes do not appreciably move air.

4,592,515

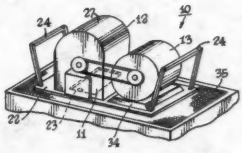
SOIL PULVERIZING MILL

Robert C. Hays, Fresno, Calif., assignor to The United States of American as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 7, 1984, Ser. No. 669,151

Int. Cl.[4] B02C *13/282*

U.S. Cl. 241—69 **6 Claims**



1. A compact, portable, power driven pulverizing apparatus in combination with a screen and a composition of matter interposed between the pulverizing apparatus and the screen, wherein the pulverizing apparatus comprises:

(a) pulverizing means including a plurality of beater-bars for breaking up said composition of matter;

(b) a power unit operably attached to said pulverizing means; and,

(c) a housing unit including a support member for attaching to said pulverizing means and said power unit, said support member comprising a substantially planar sole plate member having an opening formed therein, wherein the housing unit further includes handle means for allowing selective movement of said pulverizing means with respect to said composition of matter and said screen such that said beater-bars can selectively engage said composition of matter through said sole plate opening to break up a desired area of said composition of matter whereby the smaller segments of said composition of matter will pass through said screen.

4,592,516

COAL BREAKER AND SORTER

William H. Tschantz, Canton, Ohio, assignor to Quadracast, Inc., Canton, Ohio

Continuation-in-part of Ser. No. 520,061, Aug. 3, 1983, abandoned. This application Mar. 8, 1984, Ser. No. 587,550

Int. Cl.[4] B02C *13/04, 13/09*

U.S. Cl. 241—76 **30 Claims**

1. A coal breaker and sorter construction including:

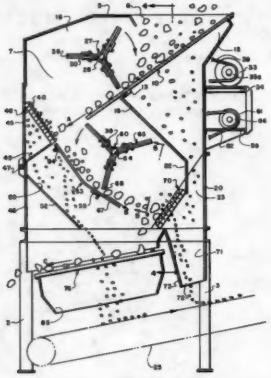
(a) hopper having a passageway formed therein extending generally from an upper end to a lower end of the hopper, said hopper also being formed with an upper opening for depositing a supply of coal into the upper end of the passageway;

(b) first surface means located within the passageway for receiving the coal deposited through the upper opening and for directing the coal as it moves by gravity along the passageway;

(c) accelerator means mounted on the hopper and located within the passageway adjacent the first surface means for increasing the speed of the coal moving along the first surface means by striking the coal and propelling substantially all of said coal moving along said first surface means in the same direction as the slope of said first surface means;

(d) splitting means located in the passageway in the line of travel of the accelerated coal for splitting the coal upon impact when the coal strikes said splitting means; and

(e) separator means mounted beneath the splitting means for separating particles of coal of a predetermined size from

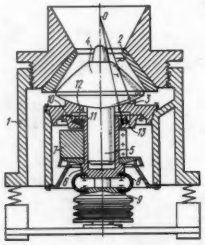


other particles contained in the supply of coal deposited in the hopper.

4,592,517
INERTIA CONE CRUSHER

Leonid P. Zarogatsky, Uglovoi pereulok, 5, kv. 21; Nikolai A. Ivanov, Novo-Izmailovsky prospekt, 19, kv. 26; Mikhail F. Korolkov, Zheleznovodskaya ulitsa, 62, kv. 99; Villi R. Laubgan, Krasnoselskoe shosse, 46, korpus 3, kv. 66; Andrei N. Safronov, ulitsa Korablestroitelei, 19, korpus 1, kv. 728; Vladimir Y. Turkin, Novo-Izmailovsky prospekt, 49, kv. 10, and Boris G. Ivanov, Basseinaya ulitsa, 5, kv. 8, all of Leningrad, U.S.S.R.

Filed Apr. 22, 1985, Ser. No. 725,650
Int. Cl.[4] B02L *2/04*
U.S. Cl. 241—207 **2 Claims**

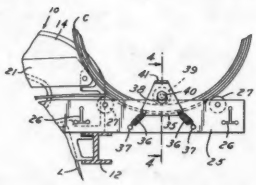


1. An inertia cone crusher comprising:
a housing;
an outer cone secured in said housing;
an inner cone mounted concentrically with said outer cone and in space relation therewith for rotation about its axis of symmetry and for gyratory motion about the axis of symmetry of said outer cone;
a spherical support of said inner cone secured in said housing;
a shaft of said inner cone extending along the axis of symmetry thereof;
a cylindrical bearing bush mounted on said shaft;
an unbalanced mass member rigidly secured to said bearing bush;
an annular outer projection on the end of said bush facing toward said inner cone;
a spherical support of said bush comprising an annular bore of said housing concentric with said bush and having a spherical surface;
said annular projection being received in said annular bore;
a spherical end thrust bearing of said bush comprising a "floating" ring having a spherical surface and installed in said annular bore between said annular projection and said spherical surface of the annular bore, said floating ring having its spherical surface engaging the spherical surface of the bore;
a power motor;
a flexible link connecting said power motor to said bearing bush.

4,592,518
COIL HOLDER

Arthur B. Chubb, Wyandotte; Richard J. MacLeod, Milford, and James J. Rhoades, Garden City, all of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.

Division of Ser. No. 352,893, Feb. 28, 1982, Pat. No. 4,445,356.
This application Feb. 15, 1984, Ser. No. 582,124
The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.
Int. Cl.[4] B21C *47/22*; B65H *16/08*
U.S. Cl. 242—78.7 **8 Claims**



1. A coil support for supporting a coil of sheet material comprising
a coil support frame,
first and second spaced rollers for engaging the periphery of the coil,
a third roller extending through the interior of said coil and having ends,
and spring means yieldingly urging the third roller toward the first mentioned rollers comprising a bracket connected to the coil support frame solely by said spring means,
said bracket having means engaging at least one end of said third roller and being manually disengagable from said third roller.

4,592,519
HOSE ROLLER

Roy A. Peacock, 239 Tarpon St., Tavernier, Fla. 33070

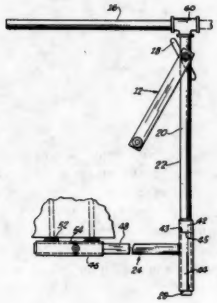
Filed Sep. 14, 1984, Ser. No. 650,451
Int. Cl.[4] B65H *75/40*
U.S. Cl. 242—86 **2 Claims**

1. A hose roller device allowing the user to steer the device with either hand in any direction and to wind up a hose with the other hand, comprising:
a member having a generally vertically longitudinal center line and an upper portion with a generally transverse axle opening and a lower portion;
a hose holder including a generally U-shaped fork with unconnected ends and a closed end, and an axle connected at one end to said closed end, said fork and said member constructed and arranged to allow a hose to be rolled up and quickly removed;
a bearing surface in said axle opening;

said axle positioned for rotation on said bearing surface in said axle opening;

said hose holder constructed, arranged and positionable about a portion of a collapsed hose to wind the hose over said hose holder from any outlying position, whereby the user can easily rotate the member into any position in the three hundred and sixty degrees to roll up hose lying outward in any of a plurality of directions;

said hose and said portion of a collapsed hose movable off of said hose holder in a direction parallel to said axle without obstruction even after the collapsed hose is completely rolled up into a roll;



said member includes a support means;

said member is positioned for rotatable movement about said longitudinal center line and supported on said support means, and

a tiller means connected to said member, said tiller means extending generally outward from said member, said tiller means for steering said hose holder and said member with one hand to position said axle generally at ninety degrees to the longitudinal center line of the adjacent hose to lay the collapsed hose about to be rolled up evenly on said fork of said hose holder by rotating said axle with the other hand of the user.

4,592,520

WEBBING TENSION DEVICE

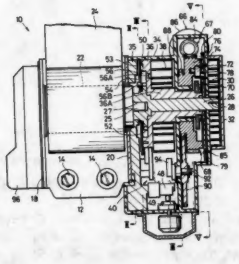
Teruhiko Kawaguchi, Aichi, Japan, assignor to Kabushiki Kaisha Toka-rika-denki-seisakusho, Aichi, Japan

Filed Jan. 29, 1985, Ser. No. 695,882

Claims priority, application Japan, Jan. 30, 1984, 59-11428

Int. Cl.[4] B60R *22/46*; B65H *75/48*

U.S. Cl. 242—107 **20 Claims**



1. A webbing tension device for imparting tension to an occupant restraining webbing during an emergency situation of a vehicle, which comprises:

(a) a first biasing means for biasing a webbing takeup shaft in a web winding direction in an emergency vehicular situation;

(b) a first clutch means disposed between the takeup shaft and the first biasing means for transmitting the biasing force of the first biasing means to the takeup shaft in the emergency vehicular situation;

(c) a winding-up drive means for winding up the first biasing means after the biasing force of the first biasing means is spent in the emergency vehicular situation;

(d) a reduction means for reducing the winding-up motion of the winding-up drive means; and

(e) a second clutch means disposed between the first biasing means and the reduction means for transmitting the winding-up force of the winding-up drive means when the winding-up drive means is operated, thereby returning the first biasing means back to its initial condition.

4,592,521

DEVICE FOR GUIDING A CABLE ONTO A REEL

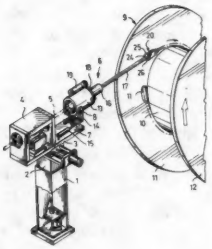
Erkki T. Hallikas, Helsinki, Finland, and Lennart Lindström, Vällingby, Sweden, assignors to Oy Nokia AB, Helsinki, Finland

Filed Nov. 20, 1984, Ser. No. 673,478

Claims priority, application Finland, Nov. 22, 1983, 834272

Int. Cl.[4] B65H *54/28*

U.S. Cl. 242—158 R **9 Claims**



1. A device for guiding movement of a cable onto a flanged reel, the guiding device comprising:

a support carriage;

arm means supported by the support carriage for movement laterally across the face of the reel, and forming a passageway for guiding the cable toward the reel; and

a guide head connected to a forward end of the arm means, and including

(i) an axial through bore for receiving the cable from the arm means and further guiding the cable toward the reel,

(ii) an outside surface extending eccentrically relative to the axis of the through bore, and

(iii) means connecting the guide head to the arm means for pivotal movement about the axis of the through bore between first and second pivotal positions, and for movement laterally with the arm means between a first lateral position to guide the cable onto the reel immediately adjacent a flange thereof to form a first cable winding of a cbale layer, and a second lateral position to guide the cable onto the reel immediately to the side of the first cable winding;

wherein when the guide head is in the first lateral and pivotal positions and the guide head pivots to the second pivotal position, the outside surface of the guide head moves against the reel flange and forces the guide head from the first lateral position to the second lateral position.

4,592,522

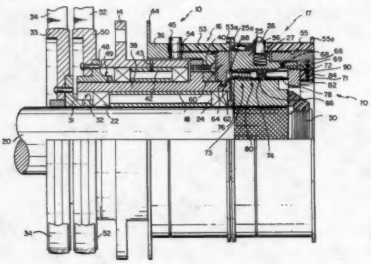
COAXIAL REEL ASSEMBLY APPARATUS

Frederic F. Grant, Bellflower, Calif., assignor to Datatape, Inc., Pasadena, Calif.

Filed Jun. 19, 1985, Ser. No. 746,497

Int. Cl.[4] G03B *1/04*; G11B *15/32*

U.S. Cl. 242—193 **11 Claims**



1. In coaxial reel assembly apparatus for mounting a first tape reel on a first reel hub for synchronous rotation with an inboard drive spindle located adjacent a reference structure, and for coaxially mounting a second tape reel on a second reel hub for synchronous rotation with an outboard drive spindle remote from said reference structure, each tape reel having a central hub opening including at least one radially projecting keyway extending axially through the tape reel, the improvement comprising:

(a) said inboard hub being mounted for both axial and rotational movement relative to said inboard drive spindle, said inboard hub further having at least one clamping projection adapted for axial passage through a reel keyway during the loading of the inboard reel onto the inboard hub from the outboard side of said reel assembly apparatus;

(b) first and second actuatable control means accessible to an operator at the outboard side of said outboard drive spindle;

(c) a rotatably mounted locking nut extending radially in the plane of the inboard reel between said inboard drive spindle and said inboard hub;

(d) linkage means extending axially through said outboard drive spindle and, responsive to the actuating of said first control means, causing the rotating of said locking nut which effects (1) an initial rotational movement of said inboard hub relative to said inboard drive spindle and thereby relative to the inboard reel, to move said clamping projection of said hub from alignment with a keyway of the inboard tape reel, and (2) a subsequent axial movement of said inboard hub relative to said inboard drive spindle, to cause said inboard hub to clamp the inboard reel between a radially extending member of said inboard drive spindle and said clamping projection; and

(e) means, responsive to the actuating of said second control means, for clamping the outboard reel to said outboard drive spindle.

4,592,523

EJECTION SEAT RESTRAINT SYSTEM FOR LIMBS AND HEAD

Gerald F. Herndon, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1984, Ser. No. 655,922

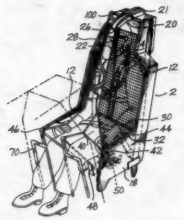
Int. Cl.[4] B64D *25/06*

U.S. Cl. 244—122 AG **17 Claims**

1. In a flight vehicle, a system for restraining movement of an occupant of an ejection seat during ejection, said system comprising:

two shrouds located on opposite sides of the seat, each such shroud being attached to its respective side of the seat and having a stowed position along said respective side;

strap means for pulling the shrouds out of their stowed positions laterally inwardly around the occupant; said



strap means including a first portion positioned above and generally at the lateral center of the occupant's head, a second portion having a stowed position above and generally between the occupant's knees, and an intermediate portion attached to the shrouds; and

tensioning means for tensioning the strap means to pull the shrouds around the occupant and said second portion aftwardly and downwardly between the occupant's legs.

4,592,524

DEVICE FOR THE SEPARATION OF A LOAD FROM A BELT ASSEMBLY

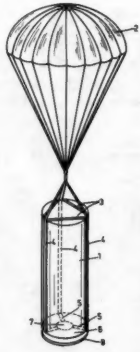
Hubert Nöhren, Hamburg, and Bruno Stürzenbecher, Norderstedt, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,406

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308177

Int. Cl.[4] B64D *17/38*

U.S. Cl. 244—151 B **34 Claims**



1. A coupling device for detachably connecting a load to a suspension system, the suspension system including plural belts which define a receptacle for the load, the load having an upper end and a lower end, said coupling device comprising:

an impact member, said impact member having a configuration which defines an impact reception area which is at least generally commensurate in size with the lower end of the suspended load, said impact member being capable of distortion in response to an impact thereon;

means for supporting said impact member from the load, said supporting means defining an initial spacing of said impact

member from the load, said supporting means engaging said impact member in a plurality of spacially separated locations adjacent the periphery of said impact member;

means for interconnecting the first ends of a plurality of the suspension system belts, said interconnecting means being mounted on the load;

movable release means for cooperation with said interconnecting means to terminate the interconnection of the first belt ends, said release means having a first inoperative position and a second position where it produces termination of the belt end interconnection; and

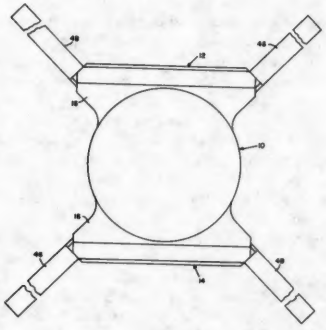
means directly mechanically connecting said release means to said impact member whereby impact induced movement of any part of said impact member toward the load will produce movement of said release member from the first to the second position.

4,592,525

COUNTER-ROTATING FOLDING WINGS

Jimmy M. Madderra, Huntsville, and John A. Schaeffel, Jr., Cullman, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1985, Ser. No. 699,284
Int. Cl.[4] F42B *13/32*
U.S. Cl. 244—3.28 **6 Claims**



1. A missile having two foldable wing assemblies rotatably mounted on opposite sides of the missile and extending longitudinally of the missile with each wing assembly including a center member and a pair of wing panels mounted thereto, each wing assembly being rotatable 90° about its mounting to position the center member and the wing panels from longitudinally of the missile to a position perpendicular to an axis along a longitudinal center line of the missile, said wing panels each being mounted by being pivoted to said center member and being spring biased outward toward each other to cause the wing panels to pivot to a position in which the wing panels form a right angle to each other from the longitudinal center line of said missile and to position the wing panels of the two wing assemblies in a cruciform shaped configuration of the wing panels relative to said missile.

4,592,526

ADJUSTABLE HOLDING DEVICE

Jacob Kobelt, 6110 Oak Street, Vancouver, British Columbia, Canada (V6M 2W2)

Continuation-in-part of Ser. No. 295,624, Aug. 24, 1981, abandoned. This application Apr. 18, 1985, Ser. No. 723,729
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—278 **8 Claims**

1. An adjustable holding device for holding an item in a desired location relative to a surface, said device having:

(a) a surface mounting bracket for securing said device to the surface;

(b) said surface mounting bracket including an adjustable shaft clamp;

(c) a first member having a complementary first hinge means;

(d) said first hinge means having a hinge face transverse to the axis of rotation of said first hinge means;

(e) said first member including a first stub shaft extending at substantially right angles to the axis of rotation of said first hinge means and rotatably adjustably clamped by and adapted for 360° rotation relative to said adjustable shaft clamp;

(f) a second member having integral spaced coplanar complementary first and second hinge means;

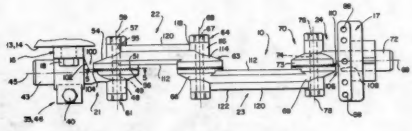
(g) said second member first and second hinge means each having a face transverse to the axis of rotation of said first and second hinge means respectively and projecting in the same direction;

(h) said second member complementary first hinge face connected to said first members hinge face in angularly adjustable lockable face to face relation;

(i) a third member having integral spaced coplanar complementary second and third hinge means;

(j) said third member second and third hinge means each having a face transverse to the axis of rotation of said second and third hinge means and projecting in the same direction;

(k) said third member complementary second hinge face connected to said second member second hinge face in angularly adjustable lockable face to face relation;



(l) a fourth member having a complementary third hinge means;

(m) said fourth member third hinge means having a face transverse to the axis of rotation of said third hinge means;

(n) said fourth member third hinge means face connected to said third member third hinge means face in angularly adjustable lockable face to face rotation;

(o) said fourth member including an integral second stub shaft extending from said fourth member third hinge means and at substantially right angles to the axis of rotation of said fourth member third hinge means;

(p) an item mounting bracket for securing an item thereto;

(q) said item mounting bracket including clamp means integral therewith and rotatably adjustably secured to and adapted for 360° rotation relative to said second stub shaft;

(r) said third member having a longitudinal face extending between the respective hinge faces and said longitudinal face lying in a first plane;

(s) said second member having a longitudinal face extending between the respective hinge faces and said second member longitudinal face lying in a second plane;

(t) said first and second planes being spaced from and parallel to each other for providing maximum load connection and reduced torque condition between said surface mounting bracket and said item mounting bracket; and

(u) the axis of rotation of said first hinge means, said second hinge means and said third hinge means are parallel to each other whereby force applied to said item mounting bracket is transmitted to said surface mounting bracket in a direction normal to the parallel hinge axes.

4,592,527

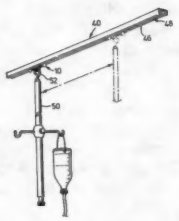
OVERHEAD TROLLEY

Alexander D. Karapita, 38 Robinter Drive, Willowdale, Ontario, Canada (M2M 3R2)

Continuation-in-part of Ser. No. 207,227, Nov. 17, 1980, abandoned. This application May 4, 1983, Ser. No. 491,348

Int. Cl.[4] A47H *1/10*

U.S. Cl. 248—318 **20 Claims**



1. A trolley for suspending a weight from a horizontal overhead track, comprising:

means locatable above the track and slidable along the track;

friction means locatable below the track; and

means interconnecting the slidable means and the friction means to suspend a weight therefrom and to provide a moment couple between the slidable means and the friction means about the track, whereby on suspension of a weight from the interconnecting means the friction means is moved towards the track to lock the trolley in any preselected position along the track.

4,592,528

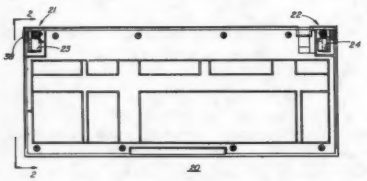
LEG ASSEMBLY FOR A KEYBOARD OR THE LIKE

Charles A. Still, Clinton, Mich., assignor to Northern Telecom Limited, Montreal, Canada

Filed May 22, 1984, Ser. No. 613,061

Int. Cl.[4] F16F *15/00*

U.S. Cl. 248—359 **9 Claims**



6. A leg assembly for being mounted in a recess in a keyboard or the like, said assembly having two detent positions and comprising:

a leg member for pivotal connection to said keyboard;

said leg member having a first end, containing an aperture by which said leg member can be pivotally mounted, and a second end remote from said first end;

a pin, fixed to said keyboard, for engaging said aperture and providing a pivot axis for said leg member;

a stud carried by said keyboard and protruding into said recess;

two indentations on said leg member for mating with said stud, in two selected positions of said leg member, so as to provide said two detent positions;

a coil spring having a central coil portion and two free ends whereby said central coil portion surrounds a portion of said pin with one free end of said coil spring engaging said keyboard and the other free end of said coil spring engaging said leg member, so as both to bias said second end of said leg member away from said keyboard and to bias said leg member toward said stud.

4,592,529

SHOCK ABSORBING MECHANISM FOR REARVIEW MIRROR ASSEMBLY OF MOTOR VEHICLE

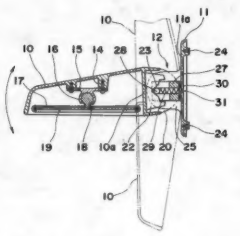
Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 4, 1983, Ser. No. 548,870

Claims priority, application Japan, Nov. 4, 1982, 57-194295[U]

Int. Cl.[4] B60R *1/02*

U.S. Cl. 248—475.1 **5 Claims**



1. A shock absorbing mechanism for rearview mirror assembly of a motor vehicle which mechanism arranges a mirror body to be movably supported in a horizontal direction with respect to a mounting stay mounted on the motor vehicle, comprising:

a pair of rotary stays each protruding from opposite walls at an engaging portion between the mounting stay and the mirror body and rotatably connected with each other by an axial shaft,

a cam plate having an index groove formed in one of the opposite walls, and

a follower piece resiliently fitted into the groove provided in another one of the opposite walls, said groove of the cam plate having a central notch for a standing position and at least one side notch for an inclined position formed, respectively, in the center and in one side of the cam plate, said central and side notches forming fixed angles with each other,

whereby the mirror body is returned to the standing position by the force caused through the engagement between the follower piece and the central notch for the standing position when the mirror body is moved within fixed angles centering around the standing position, while the mirror body is kept in the inclined position through the engagement of the follower piece with the side notch for the inclined position when the mirror body is moved beyond the fixed angles.

4,592,530

UNIVERSAL MOUNTING BRACKET FOR GAS PUMP TOPPERS

James R. Seely, Rochester, and David U. Hillstrom, Novi, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Apr. 16, 1984, Ser. No. 600,825

Int. Cl.[4] A47F *7/14*

U.S. Cl. 248—475.1 **25 Claims**

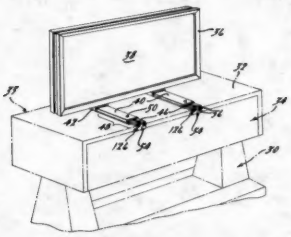
1. A mounting bracket for securing a display device to a gas pump fixture comprising:

a cross brace member defining a first channel and having means adapted for receiving said display device;

at least one slider member for nesting assembly with said cross brace member, said slider member having an out-

wardly presenting end and an opposing inner end and being slidable within said first channel;

fastener means assembled on said cross brace member and engageable with said cross brace member and with said slider member for inhibiting sliding movement of said slider member within said first channel; and



clip means attachable to said slider member for gripping said fixture and thereby securing said display device to said fixture;

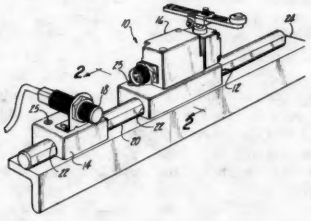
said slider member having means for defining a second channel open at said inner end for slidably receiving said fastener means through said open end during the nesting assembly of said slider member.

4,592,531

LINEAR SWITCH POSITIONING DEVICE

Raymond J. Schihl, Dryden, Mich., assignor to Melvin-AHD, Flint, Mich.

Filed Apr. 26, 1985, Ser. No. 727,879
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—646 **6 Claims**



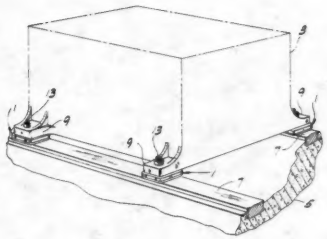
1. For use as a linear switch positioning device, a movabl carriage and rod assembly comprising, in combination: an elongated guide rod; a generally rectangular carriage block having: a bore through which said rod extends from the ends thereof for movement of said carriage block along said rod to a predetermined position; a slot having sides extending inward from a side of said block intermediate the ends of said block, said slot intersecting said bore at a mid position thereof; a threaded aperture extending through the top of said block intersecting said slot midway between the sides of said slot; means for attaching said switch thereto; a pair of balls within said slot between said threaded aperture and said rod; and a screw extending into said threaded aperture with a conical end for engaging said balls and wedging them between said rod and the opposite sides of said slot to lock said carriage block in said predetermined position on said guide rod.

4,592,532

EXPANSIBLE SUPPORT AND METHOD OF USE

M. Randall Stith, Jr., R.R. #1, Box 13, Webster, Ky. 40176

Filed Nov. 14, 1983, Ser. No. 551,574
Int. Cl.[4] B66F *3/24*
U.S. Cl. 248—649 **10 Claims**



1. An expansible support adapted for supporting a heavy industrial machine or the like on a foundation, said support comprising a pair of base members having substantially planar bottom faces adapted for face-to-face engagement with a generally flat upwardly facing bearing surface on the foundation, a single support member spaced above the base members having a substantially planar top face adapted for face-to-face engagement with a generally flat downwardly-facing bearing surface on the machine, first and second relatively flat annular members connecting respective base members and the support member, said annular members being expansible for permitting relative movement of the support member away from the respective base members, said annular member, base members and support member combining to define first and second enclosed expansible chambers within respective annular members, and inlet port means communicating with said expansible chambers for delivery thereto of fluid under pressure, said support being adapted to be positioned between said foundation and machine bearing surfaces with the bottom faces of the base members resting on said foundation bearing surface and to have fluid then introduced under pressure via said inlet port means into said expansible chambers whereupon said annular members are adapted to expand and the support member to move upwardly relative to the base members thereby to bring the top and bottom faces of the respective members into load-bearing contact with said bearing surfaces, said annular members being adapted for permitting the top and bottom faces of the respective base and support members to move out of parallel with respect to one another for full face-to-face contact with nonparallel bearing surfaces, said support member having a slot therein for receiving an anchor bolt when the support is placed between the foundation and the machine, said base members and associated annular members being connected to the support member on opposite sides of the slot, said inlet port means comprising inlet passages in said support plate, and outlet port means comprising outlet passages for exit of air from respective first and second chambers as fluid is introduced into the chambers, said inlet passage of said second expansible chamber being in fluid communication with said outlet passage of said first expansible chamber for flow of fluid from said first chamber when it is filled to said second chamber to fill the second chamber.

4,592,533

SOLENOID-OPERATED TWO-WAY DIRECTIONAL NEEDLE-VALVE, NORMALLY CLOSED

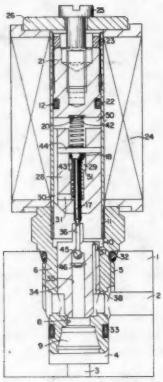
Mauro Guglielmi, Modena; Antonio Pighetti, Formigine; Savino Vezzani, and Sergio Acerbi, both of Modena, all of Italy, assignors to Edi System s.r.l., Italy

Filed Sep. 16, 1982, Ser. No. 418,618

Claims priority, application Italy, Dec. 17, 1981, 40128 A/81

Int. Cl.[4] F16K *31/124, 31/02*

U.S. Cl. 251—30.01 3 Claims



1. A valve formed with an inlet and an outlet and comprising:

an actuating coil that can selectively be placed in deenergized and energized states;

a core mounted adjacent to said coil for movement between a first position and a second position and moving from said first position to said second position in response to placement of said coil in said energized state;

a valve member movably mounted adjacent to said core;

a seat for said valve member, said valve member being engageable with and disengageable from said seat and said inlet and outlet being isolated from each other when said valve member engages said seat and in communication with each other when said valve member is disengaged from said seat;

first biasing means engaging said valve member and effective when said valve member is disengaged from said seat for imparting additional movement to said valve member away from said seat;

second biasing means engaging said core and effective when said coil is in said de-engerized state for returning said core to said first position;

first check elements formed on said valve member and on said moveable core and engageable with each other when the movable core nears said second position; and

at least one second check element mounted on the movable core and engageable with the first check element of the valve member for urging the valve member toward said seat upon placement of said coil in said de-energized state.

4,592,534

VALVE ASSEMBLY

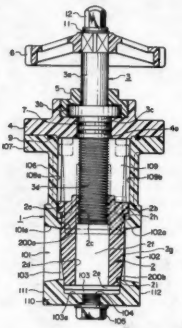
Tomoyuki Ueda, and Hirotoshi Ogawa, both of Nobeoka, Japan, assignors to Asahi Yukisai Kogyo Co. Ltd., Nobeoka, Japan

Continuation-in-part of Ser. No. 326,010, Nov. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 177,613, Aug. 13, 1980, abandoned. This application Dec. 15, 1983, Ser. No. 561,699

Claims priority, application Japan, Aug. 13, 1980, 55-45998

Int. Cl.[4] F16K *31/44*

U.S. Cl. 251—266 4 Claims



1. A valve assembly comprising in combination a valve body made of a hard synthetic resin preferably PVC and having a fluid passage laterally arranged therethrough;

a non-rotatable, axially bored valve member made of a hard synthetic resin softer than that of the valve body and movable within the valve body perpendicular to said fluid passage and holdable at any position at and between a full-closing position and a full-opening position relative to said fluid passage, said valve member taking a general imaginary shape close to a true cylinder and having a taper of 1/10–1/30, the practical configuration thereof being generally of a convexedly curved one in the direction of its taper;

a pair of separated valve seats formed in said valve body unit and around said fluid passage, each having a generally tapered planar surface corresponding with the taper of the valve member; and

a shallow concave recess formed on bottom wall surface of said valve member and kept in fluid connection with said axial bore of the latter adapted for avoiding fluid trapping which may otherwise occur when said valve member is being brought into its closing position; the material resin being softer than that of the valve body unit and preferably polypropylene.

4,592,535

DAMPER BLADE

Robert J. Magill, Whitstable, and David J. Gaiger, Deal, both of England, assignors to Actionair Equipment Limited, Whitstable, England

Filed Jan. 25, 1985, Ser. No. 695,704

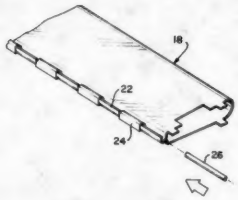
Claims priority, application United Kingdom, Jan. 27, 1984, 8402219

Int. Cl.[4] F16K *1/16*

U.S. Cl. 251—298 2 Claims

1. A rigid blade for use in a fluid damper, said blade being made by bending a one-piece sheet metal blank into an elongate U-section channel member and bringing the longitudinal edges of the channel together to form a trailing edge of the blade, wherein said longitudinal edges of the channel are of castellated form throughout their length with castellations on one longitudinal edge of said blank being so formed that the gaps

between adjacent castellations are in alignment transversely of the blank with the castellations on the other longitudinal edge and are of the same length as the castellations on said other longitudinal edge whereby those edges interlock when brought together to prevent relative movement between the edges, said castellations being first bent into a hook formation whereby U-shaped grooves are formed in the castellations to



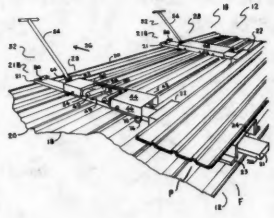
receive a reinforcing locking rod extending the full length of said blade trailing edge, said hooked castellations thereafter being rolled over to embrace the rod very tightly in order to increase the resistance of the blade to bending and twisting stresses and to avoid the necessity for any welding at the blade trailing edge, the rod thereby being hidden from sight apart from its ends.

4,592,536

APPARATUS FOR DISTRIBUTING A STACK OF ROOF PANELS ATOP A ROOF

Donald W. Jasinski, 3380 B. Mack Rd., Saginaw, Mich. 48601-7109

Filed Jul. 20, 1983, Ser. No. 515,395
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—8 R **15 Claims**



1. Apparatus for hauling a stacked bundle of roof panels atop a building roof structure having a plurality of generally parallel, spaced-apart rafters, said apparatus comprising:

track means for mounting on a roof structure;

at least one panel support cart, comprising: carriage means including

an inner, downwardly opening, inverted U-shaped elongate channel member including a first base member overlying said track means and a first pair of laterally spaced-apart, longitudinally extending legs depending therefrom;

roller means mounted on said inner channel for rollingly engaging said track means; and

load carrying platform means mounted on said carriage means for longitudinal and vertical movement relative thereto, including

an outer, downwardly opening inverted U-shaped elongate channel member including a second base member overlying said first base member and a second pair of laterally spaced-apart, longitudinally extending legs depending therefrom laterally outwardly of said first pair of legs;

means coupled to and reacting between said carriage means and said load-carrying platform means for relatively longitudinally moving said carriage means and said load carrying platform means between rest positions and longitudinally displaced positions; and

means reacting between and responsive to relative longitudinal movement of said carriage means and said load-carrying platform means for vertically guiding said load-carrying platform means between lowered and raised levels as said carriage means and said load-carrying platform means are relatively moved between said rest and longitudinally displaced positions, to lift a stacked bundle of panels, comprising;

vertically upwardly inclined slots in said first pair of legs and laterally extending cylindrical roller means spanning said second pair of legs and received by said upwardly inclined slots in said first pair of legs; and

means for moving said track means relative to said stacked bundle of roof panels as said cart continues to by bodily longitudinally moved after a predetermined relative longitudinal movement of said cart and said track means and said platfrom means and said carriage means are in said rest positions including

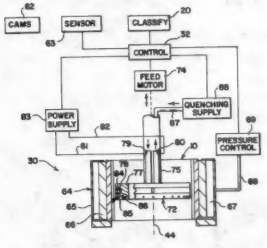
means mounted on a downstream portion of said track means in the path of said cart to contact said cart such that further longitudinal movement of said carriage means forces movement of said track means.

4,592,537

APPARATUS FOR HEAT TREATING AND SIZING THIN WALLED ARTICLES

George D. Pfaffmann, Farmington, Mich., and Paul L. Day, Parma, Ohio, assignors to Tocco, Inc., Boaz, Ala.

Filed Jan. 7, 1985, Ser. No. 689,454
Int. Cl.[4] C21D *11/00*
U.S. Cl. 266—78 **6 Claims**



1. An apparatus for heat treating thin walled cylindrical parts of a ferrous material to a finished internal diameter and hardness within a product specification comprising:

means for inductively heating the internal surface of the part to form an austenitic structure;

means for quenching the inductively heated surface at a rate establishing said hardness within a product specification and transformation of said austenitic structure to a martensitic structure;

means for compressively loading the external surfaces of the part during said heating and quenching at a level resisting thermal expansion during heating and grain growth of said martensitic structure during said quenching sufficient to establish said finished predetermined internal diameter within a product specification upon cooling of the part to ambient conditions.

4,592,538

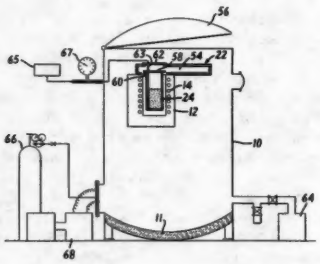
APPARATUS FOR PRODUCING PREDOMINATELY IRON ALLOY CONTAINING MAGNESIUM

James E. Wells, III, Kenmore, N.Y., assignor to Elkem Metals Company, Pittsburgh, Pa.

Division of Ser. No. 418,238, Sep. 15, 1982. This application Oct. 23, 1984, Ser. No. 649,949

Int. Cl.[4] C21C *7/00*

U.S. Cl. 266—216 14 Claims



1. Apparatus for producing a predominately iron alloy containing magnesium which comprises a pressure vessel, a charge vessel positioned inside said pressure vessel for receiving an iron-magnesium alloy charge, a chill mold positioned inside the pressure vessel and positioned in close proximity to said charge vessel for receiving molten alloy from said charge vessel such that rapid cooling and solidification of said molten alloy takes place in said chill mold, means for sealing said pressure vessel, means for supplying inert gas under pressure into said pressure vessel and means for heating the charge in said charge vessel to melt temperature.

4,592,539

DEVICE FOR ARRESTING A STEEL MAKING CONVERTER

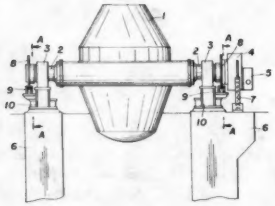
Horst Willaschek, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg, Fed. Rep. of Germany

Filed Jan. 10, 1985, Ser. No. 690,152

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400892

Int. Cl.[4] C21C *5/50*

U.S. Cl. 266—246 4 Claims



1. An arresting device for preventing a steel making converter from moving itself during a blowing operation comprising a converter having a trunnion which extends on each side of said converter, a braking disc connected directly to at least one of said trunnions and being disposed substantially perpendicular to the axis thereof, a fixed support for rotatably supporting said trunnion a pair of jaws disposed respectively on opposite sides of said disc, a compressive mechanism on said support, said jaws being connected to said compressive mechanism for movement together into braking contact with said disc, and drive means on said support connected to and for drivingly rotating of said trunnion located on one side of said converter, said compressive mechanism being located on said one side.

4,592,540

DAMPING CAPACITY ADJUSTING MECHANISM FOR AN AIR SUSPENSION

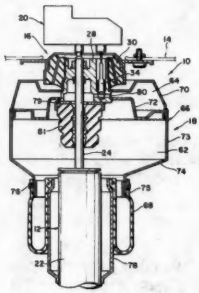
Yuji Yokoya; Shuuichi Buma, and Hitoshi Araki, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 13, 1984, Ser. No. 681,378

Claims priority, application Japan, Dec. 23, 1983, 58-197198[U]

Int. Cl.[4] B60G *13/00, 15/00;* F16F *9/00, 11/00*

U.S. Cl. 267—8 R 10 Claims



1. A damping capacity adjusting mechanism for an air suspension used for an automobile comprising a shock absorber having a piston rod in which is disposed rotatably a control rod for adjusting a damping force; and an air spring having a main air chamber and an auxiliary air chamber, wherein said damping capacity adjusting mechanism comprises:

a valve body for affording and shutting off communication between said both air chambers to adjust the spring constant of the air spring;

a support having a rigid member to which said piston rod is connected and in which said valve body is disposed rotatably, and a rubber bushing disposed outside said rigid member and connected to a car body; and

an actuator provided above said support to rotate said control rod and valve body.

4,592,541

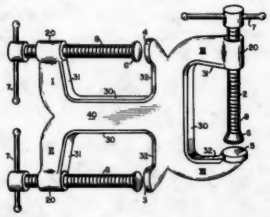
MULTIPLE WORKHOLDING CLAMP ASSEMBLY AND ATTACHMENT MEANS

Istvan Huray, R.D. #4, Rte. 378, Bethlehem, Pa. 17401

Filed May 15, 1985, Ser. No. 734,052

Int. Cl.[4] B25B *1/20*

U.S. Cl. 269—155 13 Claims



1. A multiple clamping assembly comprising:

a first slamping section (I),

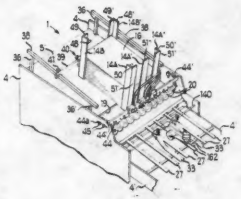
a second clamping section (II),
a third end clamping section (III),
said first, second, and third clamping sections lying in substantially the same plane,
said first, second, and third clamping sections being formed as a one-piece assembly (40),
each of said first, second, and third clamping sections having a central base (30) and arms (31, 32) extending from said central base(,) at the ends of said central base portions (30),
each of said clamping sections having a first arm (31) extending from said central base (30), said first arm (31) having means (20) formed therein for receiving a workholding element (8), said workholding element (8) having a bearing plate (6) attached to one end thereof and a handle means (7) attached to an opposite end thereof,
each of said clamping sections having a second arm (32) extending from said central base (30), said second arm (32) having a fixed bearing plate (3, 4, 5) formed thereon,
the central base portions (30) of the first, second, and third clamping sections (I, II, III) being formed as a permanent one-piece assembly joined at a central part (40) of the overall assembly,
and wherein the central base portion (30) of said first clamping section (I) is in direct and contiguous contact with the central base portions (30) of said second (II) and third (III) clamping sections without any other intervening connecting means being utilized to join said three central base portions,
wherein the workholding elements (8) lie at the peripherry of the overall assembly.

4,592,542

SUCTION SHEET SEPARATOR APPARATUS WITH PLURAL STACK CAPABILITY AND SUCTION CONTROL

Martin Selak, Des Plaines, Ill., assignor to Astro Machine Corporation, Elk Grove Village, Ill.

Division of Ser. No. 273,573, Jun. 15, 1981, Pat. No. 4,437,657.
This application Feb. 29, 1984, Ser. No. 584,793
Int. Cl.[4] B65H *3/44, 3/08*
U.S. Cl. 271—9 **3 Claims**



1. Feeding apparatus comprising: adjustable stacking means for supporting the end portion of a stack of sheets in confronting relation to a feed opening having a length encompassing many widths of the narrowest sheet to be accommodated thereby, so that one or more stacks of such material can be supported along said feed opening and the longitudinal center line of any stack thereof can be positioned along different selected points along the length of said feed opening, sheet withdrawal means for engaging the bottom surface of the bottom sheet in any stack of sheets located at almost any position along the length of the feed opening, said sheet withdrawal means comprising suction cups aligned parallel to the length of said feed opening and encompassing most of said length of said feed opening, suction control means for selectively connecting or disconnecting suction from any selected suction cup so that suction to unused cups can be disconnected, carrier means for supporting and moving said suction cups against the end position of the exposed sheet in the stack and then to withdraw the sheet therefrom, said carrier means for the suction cups including a commons support member, said common support member being pivotally supported upon a main carrier means which is raised and lowered to bring the suction cups into and out of engagement with the bottom sheet in said stack, spring means urging said common support member into a fixed position on said main carrier means, and means for simultaneously adjusting the suction plane of each of the suction cups including vertically adjustable abutment means for engaging a portion of said common support member and urging the same against the force of carrier spring means to tilt said support member the desired degree.

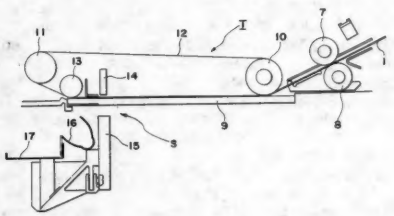
3. Feeding apparatus comprising: adjustable stacking means for supporting the end portion of a stack of sheets in confronting relation to a feed opening having a length encompassing many widths of the narrowest sheet to be accommodated thereby, so that one or more stacks of such material can be supported along said feed opening and the longitudinal center line of any stack thereof can be positioned along different selected points along the length of said feed opening, sheet withdrawal means for engaging the bottom surface of the bottom sheet in any stack of sheets located at almost any position along the length of the feed opening, said sheet withdrawal means comprising a number of suction cups aligned parallel to the length of said feed opening, said suction cups being carried on a horizontally extending pneumatic tube with a longitudinal passageway communicating with a source of low pressure, said pneumatic tube having below each suction cup a vertical sleeve projecting downwardly into said pneumatic tube, the interior of which sleeve communicates with said longitudinal passageway only through one or more openings in said sleeve, suction control means for selectively connecting or disconnecting suction from any selected suction cup so that suction to unused cups can be disconnected, said suction control means comprising a second sleeve mounted for adjustment in said first sleeve between positions which cover and uncover said one or more lateral openings, and means for moving said suction cups toward and away from said feed opening to bring said suction cups against the end position of the exposed sheet in the stack and then to withdraw the sheet therefrom.

4,592,543

ORIGINAL DOCUMENT AUTOMATIC FEEDING ARRANGEMENT FOR USE IN COPYING APPARATUS AND THE LIKE

Takuharu Tanimoto; Sounosuke Tsuda, and Mutsuo Yamasaki, all of Fukuyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1984, Ser. No. 629,487
Claims priority, application Japan, Jul. 20, 1983, 58-133081
Int. Cl.[4] B65H *5/02, 9/20*
U.S. Cl. 271—227 **5 Claims**



1. An automatic original document feeding arrangement for use in a copying apparatus and the like, the copying apparatus having a sheet feeding section for feeding an original document therefrom, a transport section provided on an original document placing platen, a transport belt for transporting the original document so that the transport of the original document is temporarily suspended upon detecting that a leading edge of

the original document has passed through a predetermined position on the platen, wherein the improvement comprises:

a transport belt composed of a light transmitting material; and

a photo-electric sensor provided at the predetermined position such that the light received by said sensor passes through both of said light transmitting transport belt and said platen.

4,592,544

PEDAL-OPERATED, STATIONARY EXERCISE DEVICE

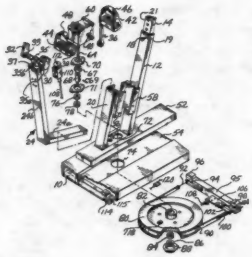
David B. Smith, Mercer Island; Randolph F. Miller, Mount Vernon, and John M. Moore, Woodinville, all of Wash., assignors to Precor Incorporated, Redmond, Wash.

Continuation of Ser. No. 658,531, Oct. 9, 1984, Pat. No. 4,533,136. This application May 8, 1985, Ser. No. 731,437

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—73 **17 Claims**



1. A stationary exercise cycle for simulating the pedaling of a bicycle, comprising:

a frame;

first and second pedal cranks mounted on said frame for rotation about a first axis;

a flywheel rotatably supported by said frame in substantially horizontal orientation, generally beneath said pedal cranks, for rotation about a second axis to generate inertia;

drive means directly coupled to and extending downwardly from said pedal cranks to drivingly engage said flywheel;

whereby rotation of the flywheel through rotation of said pedal cranks simulates for a rider the smooth pedal movement of a traveling bicycle; and,

whereby the location of said flywheel enhances the resistance to tipping of said exercise cycle.

4,592,545

ISOKINETIC EXERCISE APPARATUS AND METHOD

Steven M. Sagedahl, 750 Boone Ave. N., Golden Valley, Minn. 55427; Jeffry W. German, 6624 Stevens Ave. S., Richfield, Minn. 55423, and Robert M. Wolfe, 710 - 13th Ave. SE., Minneapolis, Minn. 55414

Continuation-in-part of Ser. No. 575,209, Jan. 30, 1984. This application Sep. 11, 1984, Ser. No. 649,435

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—125 **8 Claims**

4. An apparatus for isokinetically exercising muscles of a person, said apparatus comprising:

a shaft rotatable about a first axis directed generally toward said exercising person;

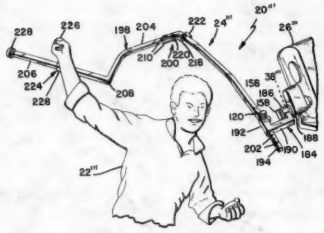
means for adjustably limiting the rotational speed of said shaft to a preset value;

an arm for applying torque to rotate said shaft, said arm including first and second sections and means for pivoting said second section with respect to said first section, said first and second sections each having arcuate portions so that said torque arm curves generally over said exercising person, said second section having also an end portion; said pivoting means being located between said arcuate portions generally above said exercising person, said end portion being inclined with respect to said first axis;

means for attaching said arm to said shaft;

means for traversing along said end portion of said torque arm;

a ball;



means for connecting said ball to said traversing means, said connecting means including means for rotating said ball with respect to said traversing means;

whereby said exercising person may isokinetically exercise the motion of throwing said ball by standing generally under said torque arm, grasping said ball and making a throwing motion at the preset rotational speed.

4,592,546

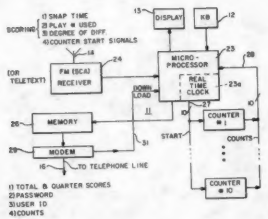
GAME OF SKILL PLAYABLE BY REMOTE PARTICIPANTS IN CONJUNCTION WITH A LIVE EVENT

Anthony C. Fascenda, Pacifica, Calif., and David B. Lockton, 97 Hawthorne Dr., Atherton, Calif. 94025, assignors to David B. Lockton, Atherton, Calif.

Filed Apr. 26, 1984, Ser. No. 604,145

Int. Cl.[4] A63F *9/22*

U.S. Cl. 273—1 E **7 Claims**



1. A game of skill playable by several remote participants in conjunction with a live event comprising:

first mass communications means for communicating said live event to said remote participants;

processing means including data storage means associated with each participant for accepting from said participant at least one prediction as to a future variable of said event and for storing all predictions over substantially the life of said event;

second mass communications means connected to said processing means substantially during said life of said event, said processing means being responsive to a signal transmitted by said second mass communications means from a central location for rendering ineffectual said participant's prediction if stored after the occurrence or determination of said variable of said event; and

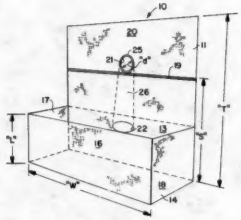
a telephone line coupled to said storage means which is responsive to said processing means for downloading, during a single very short time interval relative to said life of said event, contents of said data storage means to said central location.

4,592,547

TENNIS PRACTICE AND GAME APPARATUS

George K. Thaxton, 758 S. County Rd., Palm Beach, Fla. 33480

Filed Sep. 4, 1984, Ser. No. 646,807
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—29 A **6 Claims**



1. An apparatus for practicing and/or evaluating tennis strokes comprising:

A. a broad, flexible sheet mounted substantially vertically for receiving the impact of struck tennis balls, said sheet comprising:

(a) a target comprising a first ball receiving opening through said sheet,

(b) a second tennis ball receiving opening through said sheet, said second tennis ball receiving opening being lower than said first opening,

B. a bin for confining spent tennis balls immediately forward of said sheet,

(a) said sheet comprising the rear wall of said bin,

(b) said second opening communicating with said bin, and

(c) said bin comprising a front wall approximately 3 feet (0.91 m) high simulating a standard tennis net, and

C. chute means behind said sheet, said chute means communicating between said first and said second openings whereby tennis balls entering said first opening are delivered through said second opening into said bin.

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ECONOMICAL BOWLING CONTROL SYSTEM

Russell K. Oldson, 4700 N. Sierra Way, #207, San Bernardino, Calif. 92404

Filed Nov. 20, 1984, Ser. No. 673,413
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—43 A **7 Claims**

1. A simplified, low voltage control circuit and system for addition to an original installation bowling alley pin-setter wherein the pin-setter includes:

(a) a pinspotter mechanism including a deck for holding bowling pins;

(b) deck filler means for supplying bowling pins to said deck;

(c) motor means for operating said pinspotter mechanism and for driving said deck filler;

(d) clutch means for selectively coupling said motor means to said pinspotter mechanism; and

(e) a pin-setter electrical box including both low voltage control circuitry, and high voltage circuitry for energizing said motor means;

wherein the improvement comprises:

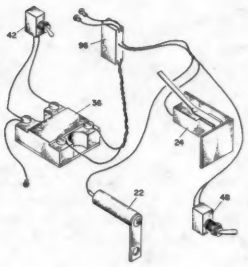
relay means mounted in said original installation pinsetter electrical box, said relay means including output terminals included in said high voltage circutiry for turning said motor means on and off, and a low voltage input circuit for operating said relay means;

first switch means coupled for operation by said clutch means to operate said relay means from said low voltage control circuitry to turn said motor on when said clutch is actuated;

second switch means coupled to indicate when the deck filler means has filled said deck with bowling pins, for maintaining said relay means energized from said low voltage control circuitry to keep said motor means running unril said deck is full;

circuit means for coupling said switches to said low voltage control circuitry;

means mounted in said original installation pin-setter electrical box for delaying the operation of said relay following operation of said second switch means to continue operation of said motor for a few seconds to complete the cycle of operation of the system;



said low voltage control circuitry being energized with AC voltage, and rectifier means coupled between said low voltage control circuitry and said relay means; and

said delaying means including at least one capacitor and resistor means for supplying current to said input circuit to said relay means from said capacitor after said switch means have opened;

whereby intermittent, energy saving operation of said motor means is achieved by the addition of a few inexpensive low voltage components included within the original installation pinsetter electrical box.

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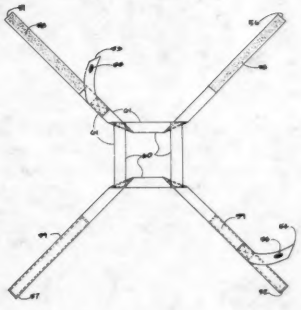
BALL HARNESS

James A. Ryan, 36151 North Grand Oaks Ct., Gurnee, Ill. 60031

Filed Jan. 2, 1985, Ser. No. 688,177
Int. Cl.[4] A63B *43/02, 67/10, 69/00*
U.S. Cl. 273—58 C **1 Claim**



1. A ball harness comprising:

a. a plurality of non-stretchable fabric straps interfastened by stitching, and defining a parallelogram with radial extensions from the corners thereof;

b. a means of fastening cords thereto, comprising integral grommeted tabs fastened by stitching, said tabs being affixed to the outward face of said straps as the plurality of straps encircles a ball;

c. the longest distance between non-adjacent corners of said parallelogram being less than one-half of the circumference of the ball which is to be inserted into the harness;

d. said radial extensions being radial straps extending from each corner of said parallelogram, so that as to each radial strap there are formed equal obtuse angles between the extending radial strap and each adjacent face of the parallelogram;

e. each pair of radially opposed straps having companion detachably interlocking hook and loop materials affixed, one of said material being affixed to the outward face of one opposed strap and the other of said materials being affixed to the inward face of the other opposed strap.

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TENNIS BALLS AND CORE THEREFOR

Kuniyasu Horiuchi, Kobe, Japan, assignor to Sumitomo Rubber Industries, Inc., Kobe, Japan

Filed May 11, 1984, Ser. No. 609,338

Claims priority, application Japan, Nov. 15, 1983, 58-215653

Int. Cl.[4] A63B *39/00*

U.S. Cl. 273—61 C **3 Claims**

1. A core for a tennis ball obtained by vulcanizing a rubber composition containing, with respect to the entire rubber content of the core, 5 to 40 weight % of a polybutadiene which contains 5-30% of a syndiotactic 1,2-bond and not less than 40% of a cis 1,4-bond, and 60 to 95 weight % of a natural rubber and/or high cis-polybutadiene containing not less than 90% of a cis 1,4-bond.

4,592,551

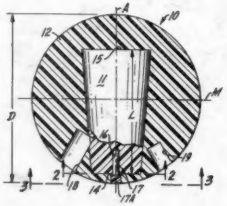
BOWLING BALL

Andrew J. Lee, Hopkinsville, Ky., assignor to Ebonite International, Inc., Hopkinsville, Ky.

Filed Mar. 21, 1985, Ser. No. 714,214

Int. Cl.[4] A63B *37/10*

U.S. Cl. 273—63 E **14 Claims**



1. An integral, solid bowling ball of the kind devoid of any significant hollow portion and comprising a core totally encompassed by and integrally bonded into a spherical bowling ball body of diameter D, in which:

the core is of elongated rod-like configuration, symmetrical about a core axis, the core axis being aligned with and corresponding to a predetermined diametrical axis of the bowling ball body;

the core has a density at least 1.6 times the average density of the bowling ball body; and

the core has an axial length L of at least 0.6D and an average diameter in cross-section of at least 0.2D.

4,592,552

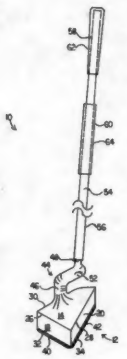
GOLF CLUB PUTTER

Robert L. Garber, 409 N. Menard, Box 445, Metamora, Ill. 61548

Filed Jan. 30, 1985, Ser. No. 696,401

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—168 **3 Claims**



1. A golf club for putting, comprising:

a head having a top surface and first and second putting faces, said top surface having first and second adjacent edges joined at a right angle and a third edge positioned opposite said right angle, said first and second putting faces extending downwardly from respective ones of said first and second adjacent edges at identical angles relative to said top surface;

a hosel extending generally upwardly from said top surface, said hosel having a first end portion connected to said top surface along said third edge of said top surface, a second end portion extending upwardly from said top surface along an axis parallel to and proximate one of said first and second putting faces and at a predetermined angle to the other of said first and second putting faces, and an intermediate portion extending transversely across said top surface toward one of said first and second adjacent edges and connecting said first and second hosel end portions; and

a shaft having a first end portion connected to said hosel second end portion, said shaft extending upwardly therefrom.

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MATRIX CATEGORY GAME

William R. Mammen, 203 East Hill Rd., Lebanon Township, Hunterdon County, and Joseph P. Pietrowsky, 39 Clayton St., Hillsdale Borough, both of N.J.

Filed Dec. 26, 1984, Ser. No. 686,469

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—240 **12 Claims**

1. Apparatus for playing information games, comprising:

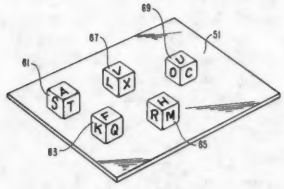
(a) a plurality of individual playing sheets having at least 3 horizontal rows and at least 3 vertical columns arranged so as to form a matrix of boxes equal to the number of horizontal rows multiplied by the number of vertical columns, said individual playing sheets further having a set of descriptive headings at the top of each column, and a second set next to each row, at least one set of descriptive headings being related to colors;

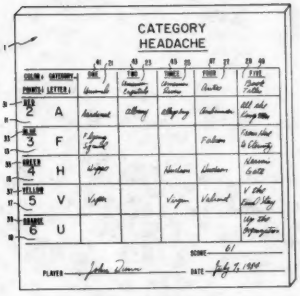
(b) a set of at least 3 dice, each having 6 facets with each facet containing a letter of the alphabet, each of said dice being of a different color than the other dice and each

such color corresponding to the colors of the descriptive headings of said individual playing sheets;

(c) a list of categories containing general categories of information for game play for insertion into one set of descriptive headings on said individual playing sheets;

(d) means for marking said individual playing sheets including the insertion of categories from said list of categories





into one set of descriptive headings on said individual playing sheets and for insertion of letters of the alphabet from said dice into the other set of descriptive headings on said individual playing sheets;

(e) means for timing players playing said information games; and,

(f) instructions for playing information games therewith.

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EQUIPMENT FOR SIMULATED SHOOTING

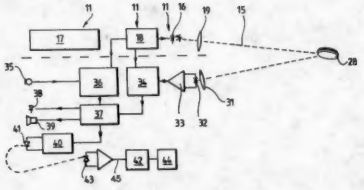
Peter Gilbertson, Manor Farm House, Garriston, Leyburn, North Yorkshire DL8 5JT, United Kingdom

Filed Apr. 3, 1984, Ser. No. 596,401

Claims priority, application United Kingdom, Apr. 5, 1983, 8309229

Int. Cl.[4] F41J *5/02*

U.S. Cl. 273—312 **3 Claims**



1. Hand held epuipment for simulating the shooting of a weapon, said equipment comprising

a projector,

a target,

means for generating a beam of electromagnetic radiation and projecting said beam towards said target in response to operation of said trigger, and

receiver means for sensing incidence of said beam on said target and signalling a "hit"; wherein

(i) said means for generating a beam of electromagnetic radiation has a power no greater than 40 mW, is adapted to generate a modulated beam, and includes means for transmitting said beam as a pulse of predetermined duration in response to each operation of said trigger;

(ii) said target comprises a reflective surface operably situated to reflect said beam back along a path substantially parallel to said incident beam irrespective of the angle of incidence of the beam; and

(iii) said receiver comprises the following components operable in series, an optical band pass filter, a photodetector, an amplifier for amplifying the signal received at said photodetector, a synchronous demodulator for excluding all but signals of substantially the same frequency and phase as said emitted beam, an electrical gate, means for detecting the operation of said trigger, and a timer activated by said means for detecting the operation of said trigger and connected to operate said electrical gate after a predetermined time, signals being forwarded to said "hit" indicator only when said gate is open; said equipment further comprising optical means resiliently mounted in the path of said beam and capable of responding automatically to movement of said projection immediately before firing with movement of said optical means to direct said beam behind the aim of said projector to account for the difference in speed of travel of said radiation and the projectile that it is to simulate, said resilience acting to return said optical means to its original position after said projector is still.

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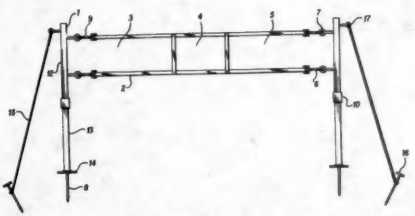
SPORTS GAME

Joseph Bradford, 11145 Cypress Glenn Ave., Baton Rouge, La. 70807

Filed Jun. 7, 1984, Ser. No. 618,378

Int. Cl.[4] A63B *67/00*

U.S. Cl. 273—402 **3 Claims**



1. A Sports game comprising:

(a) a pair of tubular poles;

(b) a pair of elongate ground rods each having a first portion for insertion into the ground and a second portion for telescopic reception of one of said tubular poles thereover, said tubular poles being telescopically received over the second portions of said rods;

(c) a flexible barricade extending between said poles, said barricade comprising a pair of generally parallel straps mounted horizontally between said poles and a pair of vertical straps connected to said pair of horizontally mounted straps and spaced from each other to define three target openings;

(d) a rubber strap connecting each end of each of said pair of horizontal straps to said poles to maintain tension in said barricade to keep it from sagging and;

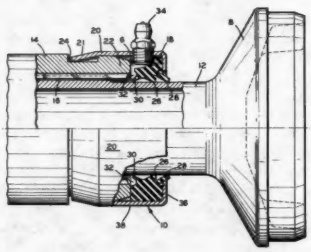
(e) an aerodynamic flying device for throwing through said target openings.

4,592,556

SLIP JOINT SEAL ASSEMBLY

Andrew L. Nieman, Temperance, Mich., and Ray A. Gall, Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 17, 1984, Ser. No. 682,121
Int. Cl.[4] F16J *15/32, 15/46*
U.S. Cl. 277—27 **15 Claims**



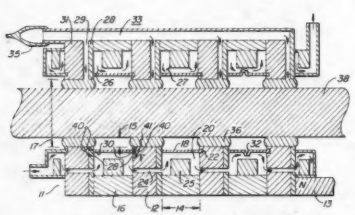
15. A slip joint seal assembly comprising an annular, elastomeric sealing body, an annular cage supporting said body, said assembly defining an annular relubrication chamber, the interior of said sealing body including two shaft sealing lips disposed for constant engagement with a shaft, said sealing body further including an auxiliary sealing lip disposed for normal non-engagement of said shaft, whereby when said relubrication chamber is pressurized, said barrier lip will engage the shaft to prevent lubrication from flowing to the sealing lip, said assembly further comprising an annular ring disposed for being positioned against the extremity of a slip spline sleeve, said ring being piloted by said cage and having a clearance with respect to said shaft which is greater than the clearance between said auxiliary sealing lip and the rotary shaft.

4,592,557

LIQUID COOLED ROTATING SEALS

Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070

Filed Feb. 7, 1985, Ser. No. 699,428
Int. Cl.[4] F16J *15/54*
U.S. Cl. 277—80 **15 Claims**



1. A ferrofluid, rotary-seal apparatus comprising:

(a) an annular permanent magnet adapted to surround the rotary shaft to be sealed and having poles of opposite polarity at each end; and

(b) a series of spaced, magnetically permeable, pole-piece elements in a magnetic-flux relationship with the one and other ends, respectively, of the permanent magnet, each pole piece having a one end and another end and adapted to surround the rotary shaft to be sealed and to form a cavity there between, the inside diameter surfaces of the stationary magnetically permeable pole piece elements comprising a plurality of spaced magnetic pole piece elements each of which acts as a separate path for magnetic flux there being ferrofluid magnetically captured between the inside diameter of each circular pole piece said ferrofluid breaching the small gap between the inside diameter of said circular pole piece and the concentrically mounted rotating magnetic shaft, there being a plurality of ferrofluid stages, sufficient to withstand needed pressure differentials, the improvement wherein:

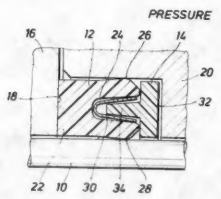
means are provided to establish a conduit for the flow of liquid coolant in close proximity to said ferrofluid seal, said conduit being established between said magnetic pole pieces and, said conduit having at least one wall of non-magnetic material, said non-magnetic wall being joined to said magnetic pole pieces in close proximity to said ferrofluid seals, said magnetic pole pieces having axial passages thereby joining adjacent conduits wherein said liquid coolant may flow through assembly of pole pieces and conduits.

4,592,558

SPRING RING AND HAT RING SEAL

John F. Hopkins, Westminster, Colo., assignor to Hydril Company, Houston, Tex.

Filed Oct. 17, 1984, Ser. No. 661,687
Int. Cl.[4] F16J *15/24*
U.S. Cl. 277—205 **13 Claims**



1. A ring seal comprising

a main body ring having a U-shape cup recess on at least one side, thereby defining legs about said recess, said recess having a round internal surface, the opening of said recess being from a direction parallel to its axis, and

a hat ring with a solid ring projection portion on at least one side for fitting into said recess of said main body ring, the end of said projection portion presenting a corner for engaging at least one leg for allowing the outward portion of said engaged leg to flex inwardly to conform to said projection portion, thereby limiting the inward collapse of said recess.

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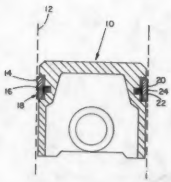
PISTON RING SEAL WITH PRESSURE DISTRIBUTION GROOVES

Andrew C. Harvey, Waltham, Mass., assignor to Foster-Miller, Inc., Waltham, Mass.

Filed Aug. 23, 1985, Ser. No. 768,951
Int. Cl.[4] F16J *9/12*
U.S. Cl. 277—214 **15 Claims**



1. Seal structure for positioning between two members disposed for sliding relative movement comprising a band compo-

nent that is adapted to be carried by one member and that has a front surface for engagement with the other member, two pressure distribution regions formed in said front surface of the band component, and a seal surface between said two pressure distribution grooves, and a backup component seated on a rear surface of said band component in general alignment with said seal surface, said backup component being free to slide on said rear surface of said band component in a direction generally perpendicular to the disposition of said pressure distribution regions and providing pressure compensation at said seal interface.

4,592,560

REMOVABLE TOOL HOLDER FOR A HAND-HELD DRILLING DEVICE OR THE LIKE

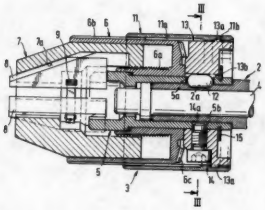
Anton Neumaier, Fürstenfeldbruck, and Werner Theissig, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Mar. 20, 1984, Ser. No. 591,382

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 3310371

Int. Cl.⁴ B23B *31/22*

U.S. Cl. 279—81 **3 Claims**



1. A hand-held device, such as a drilling device, a hammer drill, or a screw driving device, comprising an axially extending rotating spindle having first recesses formed in the outside surface thereof, an axially extending tool holder mounted on one of said rotating spindle, said tool holder comprising an axially extending carrier sleeve encircling said rotating spindle, a support ring and locking elements so that said tool holder can be removably secured on said spindle, said carrier sleeve having an inner surface and an outer surface with first openings extending radially from the inner surface to the outer surface thereof, said tool holder including means for securing a tool therein, said locking elements positioned within and being radially displaceable through said first openings, said locking elements being spaced axially in said tool holder from said means for securing a tool, said support ring encircling said carrier sleeve in the axially extending range of said first openings in said carrier sleeve and being rotatable relative to said carrier sleeve, said support ring disposed in surface contact with said locking elements for selectively securing said locking elements in said first recesses in said rotating spindle, a blocking element mounted in said support ring, said support ring having an inside surface facing said carrier sleeve and a second recess in said inside surface for each said locking element, each said second recess in the circumferential direction of said support ring having a first surface spaced outwardly from the inside surface of said support ring, a second surface extending circumferentially from said first surface and spaced further from the inside surface of said support ring than said first surface and a third surface at the end of said first surface spaced circumferentially from said second surface and forming a transition section extending radially inwardly from said first surface to the inner surface of said support ring whereby said third surface provides a limit for rotational movement of said support ring relative to said carrier sleeve, said blocking element being selectively positionable for securing said support ring so that is it held not rotatable relative to said carrier sleeve, said first surfaces of said second recesses being in contact with said locking elements when said blocking element provides rotation of said support ring relative to said carrier sleeve, and said second surfaces of said second recesses being engageable with said locking elements when said blocking element permits rotation of said support ring relative to said carrier sleeve so that said locking elements move radially outwardly through said first openings in said carrier sleeve out of engagement with said first recesses in said rotating spindle and into engagement with said second surfaces in said second recesses.

4,592,561

STEERING SYSTEM FOR VEHICLES

Yoshimi Furukawa, Saitama, and Shoichi Sano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

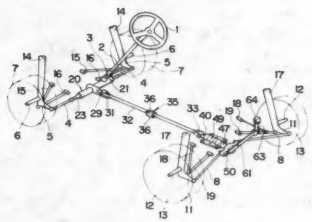
Filed Jan. 31, 1984, Ser. No. 575,444

Claims priority, application Japan, Jan. 31, 1983, 58-14420; Jan. 31, 1983, 58-14421; Jan. 31, 1983, 58-14422; Jan. 31, 1983, 58-14425

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.⁴ B62D *5/10*

U.S. Cl. 280—91 **6 Claims**



1. A steering system for a vehicle with front and rear wheels, comprising:

a steering wheel;

a front steering sub-system for steering said front wheels in accordance with the steering angle of said steering wheel;

said front steering sub-system including a drive pinion interlocked to be rotatable with said steering wheel, a rack shaft having a first rack engaged with said drive pinion and a second rack separated from said first rack, and a driven pinion engaged with said second rack;

a rear steering sub-system for steering said rear wheels in accordance with the steering angle of said steering wheel;

said rear steering sub-system including an input shaft operatively connected to said driven pinion, an off-centered pin provided at one end of said input shaft, a pair of rear tie-rods adapted to respectively turn either of said rear wheels, and a joint member relatively rotatably connected to said off-centered pin and both of said rear tie-rods; and

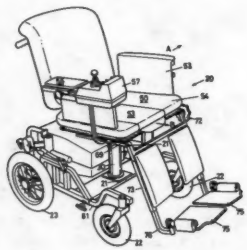
said joint member having a longitudinal axis thereof extending transversely of said vehicle, the axis of said off-centered pin being located substantially on said longitudinal axis, and said rear tie-rods connected thereto substantially on said longitudinal axis substantially at the same level as said axis of said off-centered pin.

4,592,562

WHEELCHAIR TRANSFER

Maris Strautnieks, Brighton, and Maria A. Snel, Seacombe Gardens, both of Australia, assignors to Friends of the Disabled Assn., Inc., Seacombe Gardens, Australia

Filed Aug. 2, 1983, Ser. No. 519,677
Claims priority, application Australia, Aug. 2, 1982, PF5163
Int. Cl.[4] B60N *1/08*
U.S. Cl. 280—242 WC 16 Claims



1. In a wheelchair having a main frame assembly including a pair of relatively large non-swivealable wheels and a pair of relatively smaller swivealable wheels, the improvement comprising:

a pair of seat supports, one of said seat supports supported on said main frame assembly and the other of said seat supports being adapted to be supported on the seat of a motor vehicle, said other of said seat supports having a vehicle seat engaging surface of such size and shape that it can be supported on the seat of a motor vehicle between the front and rear edges thereof, each of said pair of seat supports having a surface thereon defining at least one track which aligns with the track of the other of said pair of seat supports when positioned end-to-end therewith,

a transfer seat having track engagement means which engage said track and permit sliding of said transfer seat from a first position in which said transfer seat is supported on said one seat support to a second position in which said transfer seat is supported on said other of said seat supports,

releasable locking means for releasably locking said transfer seat in position on said main frame assembly, and

swivel means for rotatably mounting said one of said seat supports with respect to said main frame assembly so that said one seat support may be swivelled with respect to said main frame assembly from a first position in which it is facing in the direction of rolling movement of said relatively larger non-swivelable wheels, to a second position in which it is facing in a direction transverse to said direction of rolling movement,

whereby said wheelchair can be moved into close proximity with the seat of a motor vehicle to facilitate movement of said transfer seat therebetween.

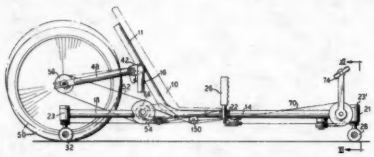
4,592,563

RECREATIONAL VEHICLE

James Dean, 514 N. Van Buren St., and Paul D. Bridges, 703 Houston St., both of Batavia, Ill. 60510

Filed Oct. 9, 1984, Ser. No. 658,873
Int. Cl.[4] B62M *1/04;* B62K *21/10*
U.S. Cl. 280—253 15 Claims

1. A recreational vehicle comprising a frame, a seat for a rider mounted on said frame, a drive wheel mounted on said frame and power means for rotating said drive wheel, said power means comprising a pair of cranks adapted to be rotated through a partial revolution by the feet of said rider between first and second positions, two lengths of cable, each connected to a separate one of said cranks, means interconnecting said lengths of cable for returning each of said cranks to said first position by rotating the same in one direction while the other crank is rotated in the opposite direction from its said first position toward its said second position, drive train means connected to said cranks for rotating said drive wheel, said drive train means comprising a drive shaft connected in operative driving relationship with said drive wheel, means including a pair of one-way clutches for connecting said cranks individually to said clutches, and means connecting each of said lengths to an individual one of said one-way clutches, whereby said drive shaft is driven alternately by said cranks through alternate ones of said lengths, and means for connecting the ends of said lengths together to form a continuous cable.

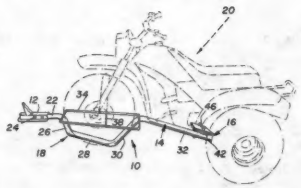


4,592,564

ATV/ATC TOW BAR

Rudolph M. Warnock, Rte. 10, Box 336; Thomas G. Alford, Sr., 106 Kings Rowe, and Thomas G. Alford, Jr., 316 Sky View La., all of Vicksburg, Miss. 39180

Filed Oct. 19, 1984, Ser. No. 662,746
Int. Cl.[4] B60D *1/14*
U.S. Cl. 280—402 8 Claims



1. A towing device for towing an all terrain vehicle having at least a forward wheel and a pair of rear wheels, said device comprising a tow bar in the form of a single structural member having a forward section and a rearward section, said forward section having a first substantially straight portion, a second portion connected to and angled downwardly from said first portion, a third portion connected to and angled from said second portion, and a fourth portion connected to and angled upwardly from said third portion, said rearward section having a forward and rearward end with said forward end being connected to and angled downwardly from said fourth portion, the length of said third portion being longer than the length of said second and fourth portions, and the length of said second and fourth portions being about equal so that said second, third and fourth portions together define an upwardly opening recess in said tow bar for receiving said forward wheel, the rearward end of said rearward section having a plate member secured thereto, said plate member having two outer edges and a plurality of spaced apart through holes, said holes being arranged to extend in at least one row along each of said outer edges and spaced inwardly therefrom, means for removably securing said plate member to said all terrain vehicle, hitch means secured to said first portion for removably coupling the towing device to a towing vehicle, a retaining collar secured between the second and fourth portions and being comprised of two spaced apart end members and two spaced apart side members connected together into an integral

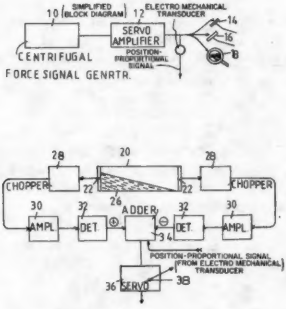
structure, said retaining collar being positioned so that said side membes lie outboard of said tow bar, said end and side members being respectively spaced apart a sufficient distance to receive said forward wheel therebetween, and wheel holding means for holding said forward wheel within said upwardly opening recess and within said retaining collar.

4,592,565

APPARATUS FOR DETECTING AN OVERTURNING MOMENT IN A MOVING VEHICLE, AND JACKKNIFING IN A TRAILER-TRUCK COMBINATION

Leo Eagle, 17 Tad La., Old Bethpage, N.Y. 11804

Filed Oct. 17, 1984, Ser. No. 661,814
Int. Cl.[4] B62D *53/06*
U.S. Cl. 280—432 **10 Claims**



1. An apparatus for detecting an incipient overturning moment in a truck-trailer combination travelling in a movement direction, said truck trailer combination being equipped with a brake pedal member, an acceleration pedal member, and a steering member, comprising in combination,

position-controlling servomechanism means,

centrifugal force measuring means for generating a pressure-indicating signal in dependence of a centrifugal force acting on said vehicle in a generally lateral direction transverse to said movement direction, including

road-curvature indicating means for operatively measuring the curvature of a road travelled on by said truck-trailer combination,

speed-indicating means for measuring the speed of said truck-trailer combination, said overturning moment being a function of said road curvature, and of said speed,

combining means for determining from the measured road curvature, and from the measured speed a parameter indicating-signal indicative of said incipient overturning moment, and

parameter indicating-signal to error signal conversion means for generating an error signal, and being arranged to transmit said error signal to said servomechanism means,

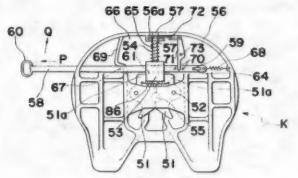
said servomechanism means amplifying said error signal, and being adapted to transmit a position-controlling force to at least one of said members so as to act thereon in a sense to reduce said incipient overturning moment, whereby turning over of said vehicle is prevented.

4,592,566

COUPLING MECHANISM FOR KING PIN

Akira Inoue, Kitakyushu, and Tadao Otsuka, Nishinomiya, both of Japan, assignors to Kyokuto Kaihatsu Kogyo Co, Ltd., Hyogo and Hitachi Metals, Ltd., Tokyo, both of, Japan

Filed Jul. 9, 1984, Ser. No. 629,071
Int. Cl.[4] B62D *53/10, 53/12*
U.S. Cl. 280—433 **3 Claims**



1. A coupling mechanism for a king pin, comprising:

a main plate member formed with an outer peripheral rib;

a pair of jaws for receiving said king pin therebetween so as to be coupled with said king pin, which are pivotally mounted on said main plate member so as to be pivoted between a king pin engaging positon and a king pin disengaging position such that an accommodation opening is defined between said jaws in said king pin engaging position;

an engaging member for locking said jaws in said king pin engaging positon, which is movably provided between said outer peripheral rib and said jaws so as to be moved between a jaw locking psoition in which said engaging member is fitted into said accommodation opening and a jaw unlocking position in which said engaging member is retracted from said accommodation opening;

a first elastic member for urging said engaging member towards said king pin into said jaw locking position so as to insert said engaging member into said accommodation opening such that said jaws in said king pin engaging position are locked by said engaging member;

a lever means for moving said engaging member into said jaw unlocking position, said lever means being pivotally and axially movably connected with said engaging member so as to be moved between a coupling position in which said engaging member is held in said jaw locking position and a release position in which said engaging member is held in said jaw unlocking position, said lever means being formed with an elongated opening;

a pin member engageable with said elongated opening and mounted on said main plate member such that said lever means is pivoted about said pin member and axially moved through engagement of said pin member with said elongated opening;

a second elastic member for urging said lever means into said coupling position;

a stopper means for preventing said engaging member in said jaw locking position for moving into said jaw unlocking position, said stopper means being operatively associated with said lever means so as to be pivotally projected into and retracted from between said outer peripheral rib and said engaging member in said jaw locking position and in said jaw unlocking position, respectively, such that said stopper means is brought into and out of engagement with said engaging member in said jaw locking position and in said jaw unlocking position, respectively; and

a guide pin projection secured to said lever means and a guide rib member engageable with said guide pin projection so that said guide pin projection is in sliding contact with the guide rib member when the lever means is displaced;

said guide rib member having a radius of curvature substantially equal to a distance measured between said pin mem-

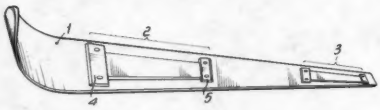
ber and said guide pin projection at the time when said lever means is in said release position.

4,592,567

MODIFIABLE STIFFNESS SKI

Leo Sartor, Caerano, Italy, assignor to Caber Italia S.p.A., Montebelluna, Italy

Filed Oct. 11, 1983, Ser. No. 540,960
Claims priority, application Italy, Oct. 19, 1982, 41656 A/82
Int. Cl.[4] A63C *5/07*
U.S. Cl. 280—602 **3 Claims**



1. A ski with modifiable stiffness characteristics comprising a basic ski structure, a first front block attached to a front portion of said basic ski structure, a first rear block attached to said front portion of said basic ski structure, said first front block and said first rear block being superimposed on said front portion of said basic ski structure and selectively spaced apart, said ski with modifiable stiffness characteristics further comprising a second front block attached to a rear portion of said basic ski structure, a second rear block being attached to said rear portion of said basic ski structure, said second front block and said second rear block being superimposed on said rear portion of said basic ski structure and lying coaxial with respect to said first front block and said first rear block, said basic ski structure having a longitudinal mid axis, all of said blocks lying over said longitudinal mid axis, one of the first and second front blocks and one of the first and second rear blocks having rigidly associated therewith a protuberance extending parallel with respect to said basic ski structure and facing a corresponding block, another one of said first and second front blocks and another one of said first and second rear blocks having removably associated therewith a removable element, a recess defined between said basic ski structure and each protuberance and between said basic ski structure and each removable element, each recess defining a height dimension, a first replaceable batten having at least one end, at least another end, engaging with said first front block and said first rear block respectively, a second replaceable batten having at least one extremity and at least another extremity, engaging with said second front block and said second rear block respectively, said first and second replaceable battens being adapted to be replaced by battens selected among stiffer or more flexible battens to be put in their place, said battens having at each of said ends and extremities thereof a tongue, each tongue defining a thickness dimension correpsonding to said height dimension defined by said recess to enable said battens to fit tightly in said first front block and in said first rear block and in said second front block and said second rear block respectively, said first rear block and said second front block being spaced apart for accommodating therebetween a ski boot placed on said basic ski structure.

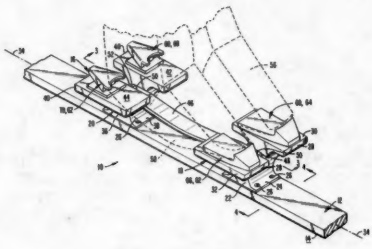
4,592,568

SKI BOOT MOUNTING STRUCTURE FOR FACILITATING MONOSKIING ON SNOW

Damir R. Priskich, 263 Bella Vista Way, San Francisco, Calif. 94127

Filed Jul. 23, 1984, Ser. No. 633,327
Int. Cl.[4] A63C *5/00*
U.S. Cl. 280—607 **18 Claims**

1. A monoski comprising an elongated ski with a longitudinally extending running surface and longitudinally extending control edges along opposite edges of the running surface and a mounting structure mounted generally centrally on the ski providing a raised platform above the ski and having ski boot binding means mounted on the platform for supporting both feet of a monoskier on the raised platform at an elevated position above the running surface of the ski for monoskiing, the mounting structure comprising forward and rear platform elements non-relasably mounted on the ski and which are



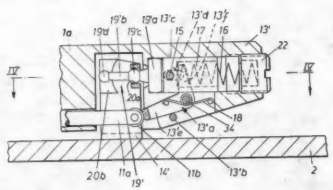
interconnected by a flexible member disposed at a distance above the ski such that the flexible member remains elevated above the ski during deflection of the ski, whereby the flexible member strengthens the mounting structure and permits both upward and downward deflection of the ski along the longtitudinal axis of the ski while absorbing said deflection.

4,592,569

RELEASE SKI BINDING

Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna; Klaus Kruschik, Gumpoldskirchen, and Robert Taucher, Podersdorf, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 15, 1983, Ser. No. 561,715
Claims priority, application Austria, Dec. 16, 1982, 4571/82
Int. Cl.[4] A63C *9/081, 9/085*
U.S. Cl. 280—624 **11 Claims**



1. In a release ski binding comprising a sole plate which in its central region is pivotal about a generally vertical axis and tilted up about a transverse horizontal axis which is arranged in front of said vertical axis, said sole plate being held on a ski in a skiing position by a resilient holding mechanism, said holding mechanism being responsive to a pivotal movement of said sole plate relative to the ski and, upon reaching a predetermined angle of traverse effecting an opening of a locking mechanism, comprising the improvement wherein said locking mechanism includes plural jaws on said sole plate movable between a ski shoe holding position and a ski boot releasing position, a locking member movably supported on said sole plate and being operatively coupled to said plural jaws to effect a movement of said jaws between the respective positions thereof in response to a movement of said locking member, a movement of said locking element in a first direction effecting a movement of said jaws into said ski shoe holding position, a spring housing movably supported on said sole plate, a spring mounted in said spring housing and control means for selectively controlling the urging by said spring of said locking member in said first direction for the purpose of effecting a movement of said jaws

to said ski shoe holding position, wherein said control means includes a toggle lever pivotally supported on said sole plate about a further axis extending transversely to a longitudinal axis of said ski, wherein said spring housing has a surface means on a side thereof remote from said locking member, said toggle lever being adapted to engage said surface means to hold said spring housing and spring therein and said locking member at a position whereat said jaws are in said ski shoe holding position, wherein a piston means is provided which is reciprocally movable on said sole plate and operatively coupled to said toggle lever, and wherein a follower means is movably supported on said sole plate and is operatively coupled to said piston means, said follower means having a part thereon engaging a ski-fixed guide means so that movement of said sole plate about one or both of said horizontal axis and said vertical axis will cause said follower means to move relative to said sole plate and effect a movement of said piston means so that when said sole plate pivots to said predetermined angle of traverse, said piston means will move a sufficient distance to cause said toggle lever to disengage from said surface means to allow said jaws to move to said ski shoe releasing position.

4,592,570

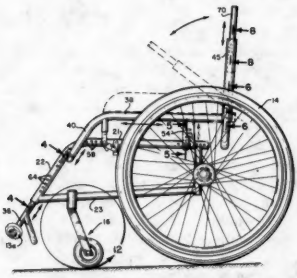
ULTRA LIGHT WHEELCHAIR

Joe-Massoud Nassiri, Thousand Oaks, Calif., assignor to Everest & Jennings, Camarillo, Calif.

Filed Oct. 27, 1983, Ser. No. 545,882

Int. Cl.[4] B62M *1/14*; A61G *5/02*

U.S. Cl. 280—650 **22 Claims**



1. An ultra light wheelchair including, in combination:

(a) a main frame;

(b) a seat frame;

(c) means for attaching said seat frame to said main frame in a plurality of different longitudinal locations, tilt angles, and heights relative to said main frame;

(d) a back frame;

(e) coupling means including pivot means for pivoting the back frame to the rear of said seat frame so that the back frame can be folded down forwardly to overlie the seat frame;

(f) left and right main wheels;

(g) means for manually attaching and detaching said main wheels to said main frame; and

(h) caster wheel means attached to said main frame forward of the main wheels whereby the back frame can be folded down over the seat frame and the main wheels detached from the main frame to enable compact storage of the wheelchair components during travel.

4,592,571

ROLL BAR FOR A MOTOR VEHICLE

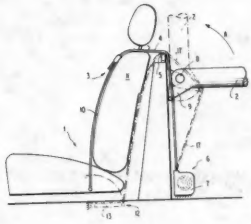
Karl-Heinz Baumann, Böblingen; Uli Mang, Weil im Schönbuch, and Wolfgang Schwede, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,992

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410676

Int. Cl.[4] B60R *21/02*

U.S. Cl. 280—756 **10 Claims**



1. A roll bar operated safety belt assembly for a convertible motor vehicle with a front seat having a back rest comprising

at least one front seat safety belt means comprising

a seat belt,

means fastening each end of the seat belt to the vehicle body at two points between which the seat belt under tension passes over the front seat,

a roll bar,

pivot means mounting the roll bar to the vehicle for rotation between a rear storage position and a vertical operative position, and

an extension means engaging the seat belt and responsive to rotation of the roll bar from its storage position to its operative position to increase tension in the seat belt to prevent any portion of an occupant from extending beyond the roll bar in its operative position.

4,592,572

RESEALABLE CONTAINER LABELS

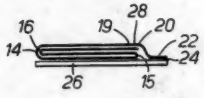
David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, England

Filed Jun. 19, 1984, Ser. No. 622,269

Claims priority, application United Kingdom, Jun. 21, 1983, 8316796

Int. Cl.[4] B42D *15/00, 15/04*

U.S. Cl. 281—2 **7 Claims**



1. A label for affixing to a container comprising a longitudinal strip of paper divided into a series of panels by a plurality of transverse fold lines, the first two panels forming a front cover and a back cover respectively for enveloping the remaining panel or panels of the strip when folded, the transverse fold lines being spaced along the strip so that upon folding of the strip the said remaining panel or panels is or are folded to lie over the back cover and is or are in turn covered by folding of the front cover about the fold line between the front and back covers; and a support web to which the said back cover is adhered, the support web being dimensioned to extend laterally at least beyond the edge of the back cover which occurs at

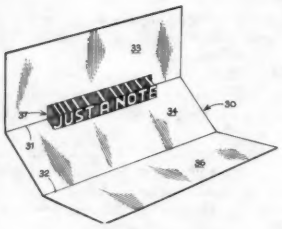
the fold line between the back cover and the remaining panel or panels, the front cover panel being dimensioned so that its free outer edge opposite to the fold line between the front and back cover panels extends beyond the area of the support web occupied by the back cover thereby to form an overlapping portion, the area of the support web which in use lies below the said overlapping portion being provided with adhesive for securing the front cover panel in a closed condition, and the inner face of the overlapping portion of the front cover panel has applied thereto a material which renders the paper hydrophobic, the material containing from 90 to 99.5 vol % polysiloxane and from 0.5 to 10 vol % varnish, thereby to allow the overlapping portion to be selectively detached from and reattached to the adhesive on the said area of the support web so as to be able repeatedly to open and close the folded label.

4,592,573

THREE-DIMENSIONAL POP-UP MESSAGE DISPLAY STATIONERY

Christopher S. Crowell, Old Lyme, Conn., assignor to Structural Graphics, Inc., Essex, Conn.

Filed Apr. 19, 1984, Ser. No. 601,977
Int. Cl.[4] G09F *1/00, 19/00*
U.S. Cl. 283—56 **10 Claims**



1. A folded stationery piece incorporating a three-dimensional message display comprising

a foldable stationery sheet having at least one fold line subdividing the sheet into a first panel and a second panel,

a first sequential message displaying array of cut-out alphanumeric indicia sheet segments substantially parallel to the first panel having proximal edges foldably joined to the second panel and distal edges spaced from the second panel,

a second sequential array of cut-out bridge web sheet segments substantially parallel to the second panel having distal ends foldably joined to the distal edges of the alphanumeric indicia sheet segments and proximal ends foldably joined to the first panel and spaced from the second panel,

with the indicia sheet segments and the bridge web sheet segments all being cut from a single sheet panel by removing portions of the panel between adjacent segments,

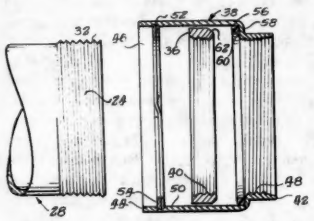
whereby each cut-out alphanumeric indicia sheet segment forms with at least one cut-out bridge web segment and the two sheet panels a collapsible folding structure having a parallelogram cross-section with diagonally opposite apices at said fold line and at a parallel line where said alphanumeric segments and said bridge web segments are foldably joined, said parallelogram cross-section being collapsed flat when the first and second panels are folded together about the fold line, and erected into an upstanding three-dimensional cut-out indicia-display configuration when the panels are hingeingly separated by unfolding the stationery sheet about the fold line.

4,592,574

CONDUIT COUPLING ASSEMBLY AND METHOD OF USE

Lawrence P. Vollmuth, Wheaton, and Robert J. Porthan, Mokena, both of Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Nov. 28, 1983, Ser. No. 555,480
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—31 **10 Claims**



1. A conduit coupling assembly for connecting the end portions of a pair of lengths of tubular conduit or the like in coaxial, abutting relationship, said end portions each having external threads of the same size, said coupling assembly comprising:

an abutment ring having an internal thread sized for threading onto the end portion of one of said lengths of conduit;

an outer coupling having a first end and a second end and a bore extending therebetween sized to slidably receive said abutment ring, said coupling first end having an inside dimension smaller than an outside dimension of said ring so that said ring is unable to move past said first end, said first end having an internal thread sized for threading onto said conduit end portions;

retainer means carried by said outer coupling adjacent its second end for preventing escape of said ring from said bore; and

resilient means disposed between said abutment ring and said outer coupling first end, said resilient means serving as a one-way coupling device to transmit frictional force from said coupling to said ring to install said ring on one length of conduit, said resilient means disengaging from said ring upon unthreading of said coupling from said one length of conduit, said resilient means being compressed between said coupling first end and said ring when said outer coupling is used to transmit force to install said ring on said one length of conduit and said resilient means returning toward its uncompressed state when said outer coupling is threaded onto the end portion of the other length of conduit, said resilient means being spaced from one of said ring and said first end when said conduits are coupled.

4,592,575

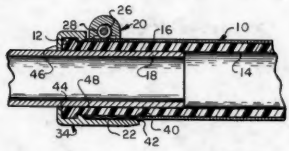
HOSE AND CLAMP CAP

Brett A. Hughes, Van Wert, and David L. Gilbert, Paulding, both of Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed Jun. 27, 1984, Ser. No. 624,958
Int. Cl.[4] F16L *33/08*
U.S. Cl. 285—252 **1 Claim**

1. A protective and decorative hose cap adapted to be mounted upon the end of a flexible hose over a hose clamp having a radially extending worm drive and wherein the hose has a cover defining an outer diameter characterized by its ease of assembly to the hose and clamp and ability to confine the hose end wherein the cap comprises an annular body having an inner open hose receiving end and an opposite outer conduit receiving end, the improvement comprising a notch defined within the cap body of sufficient circumferential dimension to receive the clamp worm drive extending therethrough, said

notch being defined by spaced axially extending edges intersecting the body inner open hose receiving end and a transversely disposed radial surface intersecting said edges and axially spaced from the body inner open hose receiving end whereby the hose clamp may be axially inserted into the cap while circumscribing the hose, an annular radially inwardly extending flange defined upon the cap body at the outer conduit receiving end, said flange defining an abutment for the hose end upon the cap body being placed upon the hose end, an annular circumferentially continuous radially inwardly extending hose cover retaining shoulder ring defined within the cap body axailly spaced from said flange and having a normal minimum diameter less than the hose outer diameter circumferentially engaging and compressing the hose inserted within the cap body adjacent the hose end, said retaining shoulder ring including a conical surface facing the cap body hose receiving end and converging in the axial direction of the cap body outer conduit receiving end whereby said conical surface aids in compressing the hose upon the hose end being inserted into the cap body and defines a sharp apex engaging the hose outer diameter to resist removal of the hose end from the cap body, the axial spacing of said notch radial surface from the body inner open hose engaging end being less than that of said shoulder ring wherein said notch terminates short of said shoulder ring, the cap body being circumferentially continuous between said flange and said shoulder ring to fully circumferentially enclose the hose end.

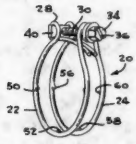


4,592,576

HOSE CLAMP WITH INCLINED BARBS

Robert H. Proctor, Cockeysville, Md., and Theodore R. Anjos, Shrewsbury, Pa., assignors to Murray Corporation, Cockeysville, Md.

Filed Dec. 12, 1983, Ser. No. 561,062
Int. Cl.[4] F16L *33/04*
U.S. Cl. 285—253 **20 Claims**



1. A wire hose clamp comprising:

(a) encircling wire means for clamping a compressible hose,

(b) means for causing said encircling wire means to be contracted including a tangentially extending operating element having a tool engaging head, said clamp being urged to rotate on the hose when force is applied to said tool engaging head by a tool to tighten said clamp, and

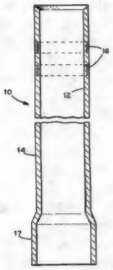
(c) hose penetrating means for penetrating a hose to which said clamp is applied extending from said wire clamping means in a direction between tangential thereto and radially thereof and in the direction of rotation of said clamp when urged by a tool applied to said tool engaging head, whereby said penetrating means penetrates into said hose upon rotation of the clamp when urged by a tool engaging said head.

4,592,577

SLEEVE TYPE REPAIR OF DEGRADED NUCLEAR STEAM GENERATOR TUBES

Paul S. Ayres, Alliance; Louis E. Stark, Youngstown; Joel G. Feldstein, North Canton, and Tzerong Fu, Stow, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 30, 1982, Ser. No. 425,212
Int. Cl.[4] F16L *13/08*
U.S. Cl. 285—287 **3 Claims**



1. A sealable sleeve for insertion into the repair of a degraded tube comprising:

a hollow core inner member of the same material as the degraded tube;

a thinner outer member of substantially pure nickel and resistant to corrosive attack, the outer member being metallurgically bonded with the inner member;

an expanded portion of the sleeve at one end for positioning in the tube within a tube sheet;

a multiplicity of grooves formed in and adjacent to the other end of the sleeve which extends into the free-standing portion of the tube beyond the tube sheet, and

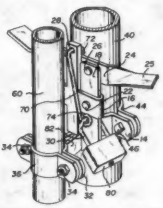
a noble metal braze material contained in said grooves.

4,592,578

LOCKABLE GATE LATCH

Herman R. Martin, 3536 Bernice Rd., Lansing, Ill. 60438

Filed Aug. 14, 1984, Ser. No. 640,922
Int. Cl.[4] E05C *1/12*
U.S. Cl. 292—40 **2 Claims**



1. A lockable gate latch assembly for use on a gate that closes to a gate post comprising:

a strike;

means for mounting the strike to one of the gate or gate post;

a catch assembly comprising:

means for mounting the catch assembly to the other of the gate or gate post;

a pair of catch members;

means for mounting the catch members so as to be movable from a home position, to which they tend to return when moved, to an open position, said members when in the home position defining a gap for, when operationally installed on a gate, receiving the strike and preventing its exit; and

means for selectively locking one or both of the catch members so as to prevent its movement to the open position said catch assembly includes a handle member operationally connected to said catch members for moving one or the other of said catch members from its home position to its open position, if not locked against such movement, in response to manual operation of the handle member; said catch assembly mounting means includes a base, and said base is provided with means for receiving a locking member such that the locking member when received therein restrains said handle member as well as the operationally connected catch members from substantial movement so as to prevent each catch member from moving to its open position; each of said catch members is mounted for generally vertical limited movement, returns to its home position by gravity, and includes an opening defined through it into which a shackle may be inserted; said assembly includes a locking member that is sized and shaped so as to be able to enter said receiving means of said base and includes means for receiving said shackle mounted such that said locking member may enter said receiving means of said base and have said shackle of a padlock received in its shackle receiving means and also passed through the opening through one of said catch members; and said catch members are of elongated metal plate configuration and are vertically mounted with a base fit into sleeves which are secured to said base, said catch members each having a vertical slot formed in them and being held in place by means of a guide member affixed to the sleeve which passes through the slot, said slot having an area exposed below said sleeve when the catch member is in its home position and that exposed slot area also serving as the opening for receiving said shackle.

4,592,579

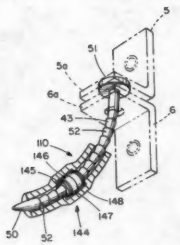
SHIPPING CONTAINER SEAL

Ralph G. Burnett, 7314 - 3rd Ave., Kenosha, Wis. 53140

Filed Mar. 22, 1983, Ser. No. 477,772

Int. Cl.[4] G09F *3/00*

U.S. Cl. 292—327 **4 Claims**



1. A shipping container seal for joining two members having holes therein comprising a male member adapted to pass through said holes in one direction and having an enlargement at one end to preclude the male member from slipping entirely through said holes, said male member being formed from a plurality of truncated conical segments, and a female member cooperating with said male member to prevent retrograde motion once said male member and said female member are assembled, said female member having locking means cooperating with said truncated conical segments to permit the male member to pass through the female member in one direction, but precluding retrograde motion said female member comprising half-barrel shaped inserts, and spring means for retaining the half barrel shaped inserts in assembled relationship, said spring means comprising a clip generally tubular in cross section and including sides spaced apart at one end and having inwardly deflected projections which cooperate with the exterior surface of the half-barrel shaped inserts and said sides being interconnected at the other end by a bridge.

4,592,580

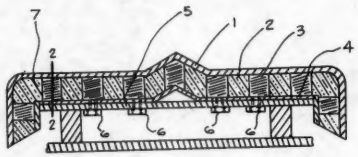
BUMPER CUSHION

Dominick Stanganelli, 2110 Campus Dr., Clearwater, Fla. 33516; Guiseppe Oddo, 1571 Ambrosia Dr., Clearwater, Fla. 33546, and Antonino Sirchia, 20 No. Hercules, Clearwater, Fla. 33575

Filed Mar. 6, 1984, Ser. No. 586,584

Int. Cl.[4] B60R *19/02*

U.S. Cl. 293—136 **5 Claims**



1. A shock absorbing bumper cushion comprising,

an elongated substantially rigid backing rail adapted for fastening to a vehicle or structure to be protected,

an impact absorbing substantially rigid front rail generally parallel to and spaced from said backing rail, said rails being maintained in generally parallel relationship by means of spaced resilient metal springs secured front and back to said backing and impact absorbing rails, the interspace between said rails being substantially filled with shock absorbing compressible resilient material, each of said spaced resilient springs being encapsulated in a wrapping of flexible tape to prevent encroachment of said compressible resilient material, whereby said springs may be compressed and relaxed on impact without interference from said shock absorbing compressible resilient material.

4,592,581

ENVELOPING GRIPPER

Frederick W. Howard, Woking, and Keith T. Strong, Ashford, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 25, 1985, Ser. No. 705,013

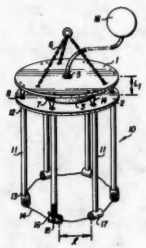
Claims priority, application United Kingdom, Mar. 21, 1984, 8407306; Apr. 19, 1984, 8410247; Aug. 9, 1984, 842091

Int. Cl.[4] B25J *15/08*; B66C *3/06*

U.S. Cl. 294—2 **8 Claims**

1. An enveloping gripper including: a support plate and a thrust plate mutually located in substantially parallel confronting relationship by a linearly extendable actuating device adapted for adjusting the separation therebetween, the support plate being provided with a circumferential array of support reeving stations and the thrust plate having a corresponding confronting array of thrust reeving stations; a gripper arm engaged with the thrust plate adjacent each thrust reeving station and projecting in a direction away from the support plate so as to have a distal end remote therefrom, which distal end is provided with a distal reeving station; and a snare line reeved from each support reeving station via the confronting

thrust reeving station and the distal reeving station of the immediately adjacent gripper arm to engage with the distal reeving station of the next adjacent gripper arm, thereby forming a circumferential snare at the distal ends of the gripper arms, which snare tightens to draw all the distal ends together when the thrust plate is driven away from the support plate by the actuating device.

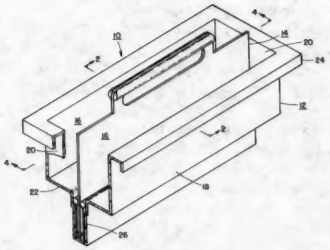


4,592,582

BAG CLAMPING ARRANGEMENT

Ardis R. Lavender, Chappaqua, and George Vrany, Bedford Hills, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,020
Int. Cl.[4] A61M *1/00*; B04B *5/00*; B65D *31/12*
U.S. Cl. 294—137 **17 Claims**



1. A bag clamping arrangement for automatically clamping and controlling the filling volume in end overflow of fluid from at least one closed flexible bag; comprising, in combination:

(a) a rigid, upwardly open receptacle having an upper compartment of generally parallel piped configuration; and a lower vertically downwardly depending compartment communicating with a bottom opening in said upper compartment, said flexible bag being insertable into said receptacle such that a portion of the bag is located in the upper compartment and a portion of the bag depends into the lower compartment;

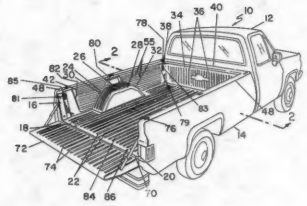
(b) and bag clamping means being insertable into said receptacle, said bag clamping means including a vertically oriented plate member downwardly movable through said upper compartment with the lower end portion thereof insertable into said lower compartment; and resilient biasing means fastened to said lower end portion of the plate member, said bag extending between the resilient biasing means and said plate member, whereby the positioning of the lower end portion of said plate member in the lower compartment will bias said resilient biasing means towards the plate member and effect the clamping of the bag therebetween.

4,592,583

TRUCK CARGO BED LINER

William L. Dresen, Baraboo; William F. Price, Portage; Phillip L. Emery, Portage, and Harlan W. Breezer, Portage, all of Wis., assignors to Penda Corporation, Portage, Wis.

Filed May 8, 1984, Ser. No. 608,341
Int. Cl.[4] B62D *33/00*
U.S. Cl. 296—39 R **21 Claims**



1. A protective truck cargo bed liner of unitary vacuum formed plastic adapted to closely fit the contours of a truck cargo bed havng a floor, two side walls, two opposed side rails which extend inward from the upper edges of the two side walls, a front wall, a front rail, two rear wheel wells and a rear access opening defined in part by the floor and opposed side rails, said truck bed liner comprising:

(a) a liner bottom wall adapted to fit on and substantially cover the full width of the truck cargo bed floor;

(b) two liner wheel wells formed in the liner bottom wall at opposite sides thereof and adapted to accommodate the truck cargo bed rear wheel wells.

(c) a liner front wall connected to and extending upwardly from the liner bottom wall, the liner front wall having an upper margin adapted to fit snugly against the truck cargo bed front wall; and

(d) two liner side walls connected to the liner bottom wall and wheel wells and the liner front wall at opposite sides thereof, the liner front wall substantially limiting the distance between the liner side walls at the front end of the liner, each liner side wall projecting upwardly from the liner bottom wall and adjacent wheel well and having an upper margin adapted to fit snugly against the corresponding truck cargo bed wall beneath and substantially outwardly displaced from the inside margin of the corresponding truck cargo bed side rail, thereby providing an optimum volume of usable cargo space, said liner side walls being inclined outwardly from the liner bottom wall at an angle greater than perpendicular to permit nesting of the truck cargo bed liner with identical truck cargo bed liners in space efficient relation wherein the bottom walls of the nested liners are in proximity.

4,592,584

ARM REST DEVICE

Pierce H. White, Jr., 804 Sampson St., Box 155, Dyersburg, Tenn. 38025-0155

Filed May 14, 1984, Ser. No. 609,746
Int. Cl.[4] B60J *9/00*; B60N *3/00*; B68G *5/00*
U.S. Cl. 296—153 **8 Claims**

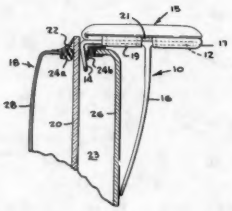
1. An arm rest device for removable and adjustable attachment to a window well formed by a panel of an automobile or the like, said panel having an upper, horizontally disposed windowsill, the windowsill having an opening passing into the window well and an inside, vertically disposed surface, said arm rest device comprising:

(a) a horizontally disposed planar support member for providing a continuous, substantially planar support surface;

(b) a vertically disposed bowed tongue connected to said support member to form a substantially T-shaped device

and to divide said support member into a leading portion and a trailing portion;

(c) a lip extending generally vertically downward from and connected to said trailing portion of said support member, said lip being spaced from said tongue a distance to permit said lip to be inserted through the opening and into the window well, said tongue extending along the inside vertically disposed surface and said trailing portion overlying at least a portion of the windowsill, whereby said arm rest device is releasably retained on the automobile



panel, said leading portion extending from the windowsill into the interior of the automobile and said support surface extends over the windowsill to provide an extended arm rest area, said tongue has an end portion curved toward said lip to form a concave surface toward said inside surface, said tongue being of a length greater than that of said lip, wherein the tip of the end portion rests upon the inside surface to provide a maximum spring length and corresponding spring action when an arm is rested upon said support surface.

4,592,585

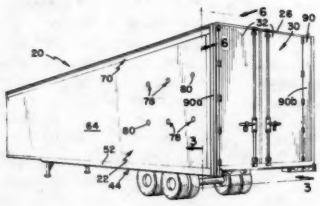
SEMITRAILER AND METHOD OF LOADING THE SAME

Donald G. Oren, 3105 Sandy Hook Dr., St. Paul, Minn. 55113, and David D. Oren, 1270 Payne Ave., St. Paul, Minn. 55101

Filed Sep. 2, 1983, Ser. No. 529,107

Int. Cl.[4] B62D *33/04*

U.S. Cl. 296—181 **12 Claims**



1. A semitrailer for hauling articles, comprising:

(a) two sidewalls, a front wall, a top wall interconnecting said sidewalls to enclose the semitrailer, and a back end including door means for access to the inside of the semitrailer, said door means including two hinged doors hingedly connected to an offset frame structure having a first vertically extending frame member on the driver's side of the semitrailer and a second vertically extending frame member on the other side of the semitrailer, said second vertically extending frame member having a thickness substantially greater than said first vertically extending frame member, said offset frame structure providing the semitrailer with structural integrity and providing little or no interference with loading articles at the back end of the semitrailer on the driver's side;

(b) a floor interconnecting said sidewalls, said floor being arched upward between said sidewalls to provide a raised floor surface along the longitudinal extent of said floor, whereby the articles when loaded in the semitrailer so as to form two rows extending longitudinally of the semitrailer are tilted outward toward the sidewalls of the semitrailer, the semitrailer having an inside width of more than one hundred inches; and

(c) a support structure for supporting said floor and said side and front walls.

4,592,586

AUTOMOBILE ROOF STRUCTURE

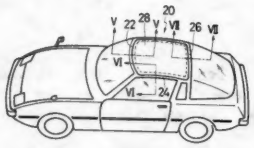
Kouichi Yagami, Zama, and Kiyoto Matsuzaki, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 6, 1984, Ser. No. 597,382

Claims priority, application Japan, Apr. 9, 1983, 58-62732

Int. Cl.[4] B60J *7/18*

U.S. Cl. 296—218 **3 Claims**



1. A roof structure of a vehicle which includes a front roof rail, side roof rails, and a rear roof rail, comprising:

a frame flange which protrudes from the top surfaces of the front, rear, and side roof rails;

a roof panel detachably installed on the front, rear, and side roof rails;

an elastic member attached around said frame flange, said elastic member making thereby a snug contact with a bottom surface of said roof panel; and

means for fixing said roof panel onto the front, rear, and side roof rails, said fixing means comprising installing brackets which are provided on the interior side of the front and rear roof rails, and a plurality of catch handles which are provided on the bottom surface of said roof panel to be hooked to the installing brackets.

4,592,587

SHAPEABLE MATRIX, AND A CHAIR USING A MATRIX

Steven J. Cousins, Ashtead; Keith N. Jones, Carshalton Beeches, and Kenneth E. Ackerley, East Croydon, all of United Kingdom, assignors to University College London, London, England

Continuation of Ser. No. 362,272, Mar. 26, 1982, Pat. No. 4,484,778. This application Sep. 19, 1984, Ser. No. 652,140

Claims priority, application United Kingdom, Mar. 31, 1981, 8109998

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 **7 Claims**

1. A chair which comprises a support frame; and a shapeable matrix mounted on the frame, the shapeable matrix comprising a plurality of first members each of which has a plurality of projections located on the periphery thereof, and a plurality of second members each of which has a plurality of recesses located on the periphery thereof, each recess being adapted to receive a respective one of the projections of an adjacent first member, and means provided on each of the second members for releasably clamping the projections of the first members in recesses of the second members, the clamping being operative in a released condition to permit alteration in the relative

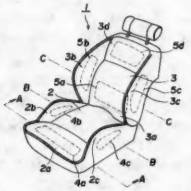
orientation of adjacent members in response to a force transverse to the plane of the matrix applied in the region of connection of said members, and being operative in a clamped condition to prevent such alteration.

4,592,588

VEHICLE SEAT

Hiroyuki Isono, and Mutsuo Kurosawa, both of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,445
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **2 Claims**



1. A vehicle seat comprising:

(a) a seat cushion having a thigh support section defined therein and a pair of side support sections formed at respective lateral portions thereof;

(b) a seat back having a lumbar support section and a shoulder support section defined thereon, and having a pair of side support section formed at respective lateral portions thereof;

(c) a first inflatable air bag incorporated within said thigh support section of said seat cushion;

(d) a second inflatable air bag incorporated within one of said pair of side support sections of said seat cushion;

(e) a third inflatable air bag incorporated within the other of said pair of side support sections of said seat cushion;

(f) a fourth inflatable air bag incorporated within said lumbar support section of said seat back;

(g) a fifth inflatable air bag incorporated within said shoulder support section of said seat back;

(h) a sixth inflatable air bag incorporated within one of said side support sections of said seat back;

(i) a seventh inflatable air bag incorporated within the other of said side support sections of said seat back;

(j) air source means for providing a source of pressurized air;

(k) pipe system means for establishing fluid communication between said air source means and each of said first to seventh inflatable air bags, inclusive;

(l) plural valve means each connected between said pipe system means and a respective one of said first to seventh inflatable air bags for permitting feed and exhaustion of said pressurized air into and out of said first to seventh inflatable air bags, respectively; and

(m) control means for collectively controlling the operation of said plural valve means at a common location, said control means including:

a console board on which a diagram of the vehicle seat is illustrated, thereby providing a diagrammatic view of the cushion seat and seat back and diagrammatically showing the thigh support section, the lumbar support section, the shoulder support section and the left and right side support sections of each of said cushion seat and seat back; and

plural switch means arranged on said console board such that they are each respectively positioned at corresponding one of said support sections shown in said diagram of the vehicle seat, said plural switch means including:

first switch means arranged on said thigh support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said first inflatable air bag, thereby to inflate or deflate said thigh support section of said seat cushion;

second switch means arranged on said left side support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said second inflatable air bag, thereby to inflate or deflate said left side support section of said seat cushion;

third switch means arranged on said right side support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said third inflatable air bag, thereby to inflate or deflate said right side support section of said seat cushion;

fourth switch means arranged on said lumbar support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said forth inflatable air bag, thereby to inflate or deflate said lumbar support section of said seat back;

fifth switch means arranged on said shoulder support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said fifth inflatable air bag, thereby to inflate or deflate said shoulder support section of said seat back;

sixth switch means arranged on said left side support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said sixth inflatable air bag, thereby to inflate or deflate said left side support section of said seat back; and

seventh switch means arranged on said right side support section shown in said diagram of the vehicle seat for causing one of said valve means corresponding thereto to operate so as to effect the inflation and deflation of said seventh inflatable air bag, thereby to inflate or deflate said right side support section of said seat back.

4,592,589

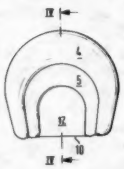
INFLATABLE-INFLATED CUSHION FOR SEAT

Klaus D. Hellwig, Brunnader Strasse 7, D-8345 Birnbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 679,958, Dec. 10, 1984. This application Mar. 11, 1985, Ser. No. 709,989
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345291
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **1 Claim**

1. An inflatable seat cushion used as a posture aid and training comprising flexible material means forming a plurality of

adjacently disposed and joined chambers, an outer surface of the cushion having an indented groove where the chambers are joined to one another, said plurality of chambers having a height which decreases from the rear towards the front, with the front corresponding to the front of a person seated in the cushion such that the cushion thereby slopes downwardly and forwardly, said chambers having a U-shaped configuration which includes two leg portions extending from a base portion, said base portion being at the rear of the cushion, each of said chambers having two halves determined by an imaginary vertical bisecting plane extending from front to rear, each of said chambers at said imaginary bisecting plane having a maximum vertical height, each of said chambers having closed ends at the terminating end of said leg portions, each of said chambers at said closed ends having a minimum vertical height, said chambers having a progressively decreasing vertical height extending from said maximum vertical height to said minimum vertical height, said chambers at said imaginary bisecting plane having maximum horizontal width, said chambers at said closed ends having a minimum horizontal width, said chambers having a decreasing horizontal width extending from said maximum horizontal width to said minimum horizontal width,



one of said U-shaped chambers constituting an outer chamber and another of said U-shaped chambers constituting an inner chamber, said maximum vertical height of said outer U-shaped chamber being greater than the maximum vertical height of said inner U-shaped chamber, the maximum horizontal width of said outer U-shaped chamber being greater than the maximum horizontal width of said inner U-shaped chamber, each of said U-shaped chambers having a top and bottom wall, crosspiece wall means disposed between adjacent U-shaped chambers, said crosspiece wall means extending between said top and bottom walls, said crosspiece wall means having openings to provide communication between adjacent U-shaped chambers, said crosspiece wall means having a U-shaped cross-sectional configuration taken along an imaginary horizontal cutting plane, said indented groove having a U-shaped configuration, said crosspiece wall means having an upper terminating end which is coincident with said indented groove, whereby the seat cushion provides, as in upright walking, extensive free movement which thereby avoids stress and which activates the erecting muscular system, the seat cushion thereby being useful as an aid or training device especially for sitting upright without a back rest.

4,592,590

HYDRAULIC LIFTING MECHANISM FOR A CHAIR OR THE LIKE USING A TWO PHASE WORKING FLUID

Mathew A. Slaats, and Patrick E. Strange, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Continuation-in-part of Ser. No. 668,307, Nov. 5, 1984. This application Aug. 29, 1985, Ser. No. 770,833

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—347 **25 Claims**

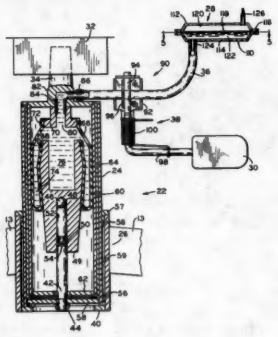
1. A hydraulic lift mechanism for an article of furniture comprising:

a base;

a support member moveable between extended and retracted positions;

a first reservoir containing a two phase working fluid and a hydraulic liquid;

a second reservoir supported by said base and containing hydraulic liquid, said second reservoir including a flexible wall and having a variable volume, said second reservoir supporting said support member for movement between said extended and retracted positions in response to variations in said variable volume;



conduit means for connecting said first reservoir to said second reservoir to transfer hydraulic liquid therebetween; and

control valve means operatively connected in said conduit means for selectively enabling fluid transfer through said conduit.

4,592,591

HOUSING FOR SEAT ADJUSTER LOCKING MECHANISM

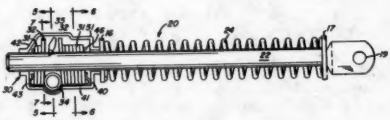
John W. Wiers, Romeo, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1983, Ser. No. 539,436

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] A47C *1/027*

U.S. Cl. 297—375 **12 Claims**



1. A housing for the operative elements of a seat adjusting device of the type which includes a rod secured for adjustment of one part of the seat and axially movable relative to a locking mechanism including a plurality of apertured washers with at least one washer one each side of and biased relative to an elongate fulcrum fixed to another part of the seat for selective locking engagement at different positions on said rod comprising:

first and second members with each member formed to provide one wall and a plurality of other walls normal to said one wall and defining a cavity complimentary to the shape of a portion of the locking mechanism and an inner peripheral edge,

said inner peripheral edge of said first member being substantially a mirror image of the shape of the inner peripheral edge of said second member,

a mounting aperture in each said wall,

two of said other walls of each of said members having aligned recesses,

means biasing said washers on each side of said fulcrum toward said fulcrum independently of said housing members,

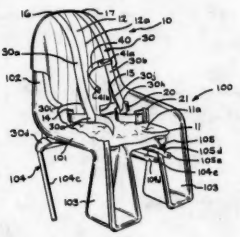
means securing said first and second members together with said inner peripheral edge of said first member abutting said inner peripheral edge of said second member, said first and second members enclosing said locking mechanism with said rod projecting through axially aligned openings provided by said recesses on said other walls and said mounting apertures supporting said housing on said fulcrum whereby the forces developed interiorly of said locking mechanism are transmitted by said fulcrum to said seat independently of said housing.

4,592,592

SAFETY DEVICE FOR BICYCLE CARRIER FOR CHILDREN

Jean M. Peek, 1639-D Spartan Village, East Lansing, Mich. 48823

Filed Oct. 15, 1984, Ser. No. 660,729
Int. Cl.[4] A47D *1/10*
U.S. Cl. 297—483 **11 Claims**



1. A safety device for mounting on a bicycle carrier for carrying a seated child, the carrier having a seat member including a seat bottom and a back support portion extending upwardly to a top adjacent to the shoulders of the child, and the carrier having a pair of frames under the seat portion which are essentially horizontal under the carrier and extend behind the seat portion and adjacent to the back support portion with means for attachment of the frames to the bicycle to support the seat member and including a waist belt which extends through two slots in the back support portion of the seat member with a buckle on the belt for securing the belt across the lap of the child, the belt having a length sufficient to encircle the waist of a child which device comprises:

a shoulder harness as a single piece and having two opposite ends secured to the belt, one end of which is attached to the belt, wherein the harness extends from the one end upwardly vertically across the shoulder of the child, over the top of the back support portion, crosses diagonally the back support portion and then around one frame and around the other frame crosses the back support again and then extends vertically across the chest of the child to attach to the belt at the other end of the harness such that there are two vertical portions of the harness across the chest of the child, wherein the safety device restrains movement of upper body of the child when the bicycle turns a corner or stops.

4,592,593

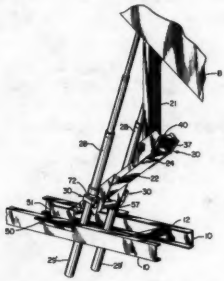
SCISSOR FRAME LIFT APPARATUS FOR DUMP TRUCKS

Glenn L. Channell, 3739 S. County Rd. 7, Loveland, Colo. 80537

Filed May 4, 1984, Ser. No. 607,141
Int. Cl.[4] B60P *1/16*
U.S. Cl. 298—22 J **9 Claims**

6. In a lift apparatus adapted for use in combination with a dump truck and the like wherein said truck has a chassis and a dump body is hinged to said chassis for upward and rearward tilting movement away from said chassis, a scissor frame having upper and lower leg members pivotally interconnected to one another, said upper leg pivotally connected to said dump body and said lower leg pivotally connected to said chassis, and hydraulically actuated lift cylinders extending between said chassis and said dump body on opposite sides of said scissor frame, the improvement comprising:

limit stop means having an angular extension of one of said upper and lower members beyond said pivotally interconnected ends of said leg members, said limit stop means defined by a pair of gusset plates affixed to opposite sides of said one leg member, said gusset plates each including a first offset portion projecting laterally from said one leg member having pivot means extending between said gusset plates pivotally interconnecting said upper and lower leg members, and said angular extension defined by a second angularly extending portion of said gusset plates projecting beyond said pivot means, and a frame stop member extending transversely between said second angularly extending portions and connecting them across said other leg member at a location spaced beyond said pivotally interconnected ends



of said leg members, said frame stop member disposed in the path of travel of the other of said leg members whereby said limit stop means limits extension of said upper and lower leg members in response to lifting by said lifting means to a substantially straightened position less than the full extension of said hydraulic cylinders and absorbs the force of said body when it is lifted to the full limit of its extension about said hinge; and

a self-centering saddle support interconnecting lower ends of said cylinder and said lower leg member including a shaft member journaled in a transverse bearing attached to said lower leg member, a yoke at opposite ends of said shaft and a connecting frame pivotally secured to said yoke, a lower end of each cylinder extending through a respective yoke and connecting frame, each lower end having a connecting plate affixed to said connecting frame, each of said connecting plates being rigidly affixed to said connecting frame and pivotally connected to said yoke about an axis normal to and in substantially the same plane as the rotational axis of said shaft.

4,592,594

BRUSHES AND THE MANUFACTURE THEREOF

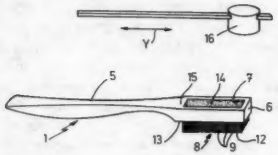
Etienne Y. d'Argembeau, 24 Rue de Belle-Vue, B-1050 Brussels, Belgium

Division of Ser. No. 356,703, Mar. 10, 1982, Pat. No. 4,441,227.
This application Dec. 20, 1983, Ser. No. 563,265
Claims priority, application Luxembourg, Mar. 18, 1981, 83225
Int. Cl.[4] A46D *1/00*; A46B *9/04*
U.S. Cl. 300—21 **5 Claims**

1. A process for obtaining a brush comprising a head supporting a multiplicity of monofilaments made of an organic thermoplastic synthetic material, such as nylon, said head

comprising an elongated hole, and wherein said process comprises the steps of:

engaging said multiplicity of monofilaments into said elongated hole so that the monofilaments are tangent to each other all along their length and protrude the desired distance from one face of the head,



severing or cutting flush said monofilaments with the opposite face of the head, and

welding said monofilaments to each other and to said opposite face of the head so that open capillary channels are formed at both ends between the monofilaments.

4,592,595

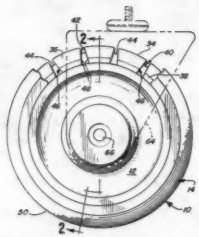
WHEEL CONSTRUCTION OF SHOPPING CARTS AND THE LIKE

Jerry Freeman, Mount Prospect, Ill., assignor to UNR Lighting, Chicago, Ill.

Filed Mar. 12, 1984, Ser. No. 588,737

Int. Cl.[4] B60B *5/02*

U.S. Cl. 301—63 PW **7 Claims**



1. A wheel construction comprising

a wheel of a first material comprising a central hub providing a central opening defining an axis of rotation for said wheel, a rim disposed radially outwardly of said hub, and web means connecting said rim and said hub,

said rim defining an outermost peripheral surface and adjoining surfaces disposed radially inwardly of said outermost peripheral surface and merging into said peripheral surface,

said rim further defining a plurality of circumferentially spaced notch means, each said notch means extending generally laterally of said rim and inwardly of said peripheral surface toward said hub, each said adjoining surface defining a plurality of notch segments each merging into a respective one of said notch means to provide a plurality of circumferentially spaced notches, each said notch segment being defined by a respective pair of inwardly-extending, inwardly diverging rim surfaces, and

a tread member of a second material molded to said rim, said tread member being generally U-shaped in cross-section and defining an outer tread surface and an inner tread surface confronting said peripheral surface, said tread member defining a plurality of radially inwardly extending projection means substantially corresponding in shape to said notch means, and said tread member further defining a pair of radially inwardly extending lateral surfaces confronting said adjoining surfaces, and said tread member including a plurality of circumferentially spaced projection segments on each of said lateral surfaces, said projection segments respectively extending into and corresponding in configuration to said notch segments for interlocking said tread member to said rim.

4,592,596

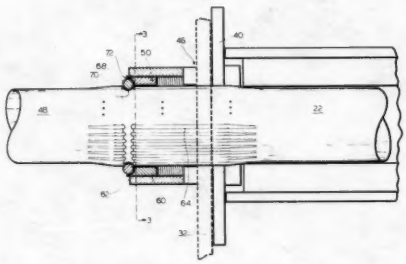
AXLE ASSEMBLY FOR ALL-TERRAIN AND LIKE VEHICLES

Gary Trautloff, 14911 "B" Moran, Westminster, Calif. 92683

Filed Sep. 5, 1984, Ser. No. 647,230

Int. Cl.[4] B60B *35/04*

U.S. Cl. 301—132 **10 Claims**



1. In an axle assembly for off-road vehicles having a swing arm carrying left and right rear wheels in which said assembly comprises an elongated shaft centrally journaled in thread-lockable relation on said swing arm and having left and right hand end portions defining wheel mounting hubs outboard of said swing arm in a manner subjecting the shaft between said hubs and said swing arm to severe bending moments likely to cause cracking in shaft threaded portions, the improvement comprising thread-lockable shaft locking means separable from said shaft, said locking means including an internally threaded nut, an exteriorly threaded slide nonrotatably keyed to said shaft, and shoulder means opposing said slide in blocking relation responsive to threaded adjustment of said nut on said slide to lock said shaft relative to said swing arm free of cracking-prone threading on said shaft.

4,592,597

HYDRAULIC BRAKE FOR VEHICLES

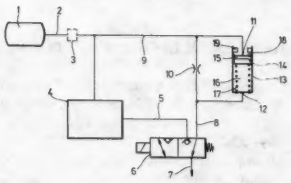
Winfried Hommen; Georg Stäuble, and Tiberius Wieser, all of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 25, 1985, Ser. No. 759,000

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427440

Int. Cl.[4] B60T *13/70*

U.S. Cl. 303—15 **4 Claims**



1. A hydraulic vehicle brake having brake adjustment valve means (4) supplied from a hydraulic accumulator (1) for form-

ing a brake pressure ro be conducted to brake cylinders by a brake cylinder pressure line (7) with an emergency brake valve (6) arranged between said brake, adjustment means and said brake cylinder pressure line, said emergency brake valve in its operating position connecting said brake adjustment valve means with said brake cylinder pressure line, and in its emergency braking position interrupting this connection and connecting said hydraulic accumulator (1) to said brake cylinder pressure line via a calibrated passage, comprising

(a) a nozzle (10) in the connection between said hydraulic accumulator (1) and said emergency brake valve (6) for limiting the brake pressure gradient to braking with limited shocks and jolts;

(b) hydraulic chambers (9, 8) on both sides of said nozzle (10) connected to end connections (11, 12) on both sides of a cylinder (13); and

(c) a piston (14) sealingly displaceably positioned in said cylinder (13), said piston being resiliently loaded in a direction of displacement toward the end connection (11) at the hydraulic accumulator side.

4,592,598

PULSATING BRAKE ACCELERATOR FOR RAIL VEHICLE AIR BRAKE

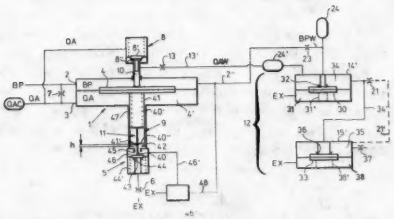
Josef Hintner, Türkheim, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 492,318, Mar. 6, 1983, Pat. No. 4,552,411. This application Jul. 17, 1985, Ser. No. 755,752

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3232047; Mar. 25, 1983, 3211037

Int. Cl.[4] B60T *15/30*

U.S. Cl. 303—37 **12 Claims**



1. Pulsating brake accelerator (4, 8, 12) for an indirectly operating air brake for rail vehicles, operating at any braking level of a service brake application (control braking) and having a first inlet opening (2) for brake line signals and a second inlet opening (3) for reference pressure signals, said reference pressure signals originating in a control chamber (QAC) which is connected with a brake pipe (BP) via a filling nozzle (7), said brake accelerator (4, 8, 12) having a control organ (4) that reacts to pressure differences between the pressure signals at said first and second inlet openings (2, 3), a control element (4) controlling a first valve device (8) for the operation of a pulsator (12) which releases repeated air pulses from said brake pipe to atmosphere during every braking level, said first valve device (8) being connected to said control chamber (QAC), via a first nozzle (13), to said pulsator, wherein:

(a) said pulsator (12) is directly connected to said brake pipe (BP) via a second nozzle (23);

(b) said pulsator (12) forms a mixed pressure from a first derived pressure (QAW) and a second derived pressure (BPW), said first pressure (QAW) being derived from the pressure in said control chamber (QAC) via said first nozzle (13) and said first valve device (8) and said second pressure being directly derived from the pressure in said brake pipe (BP) via said second nozzle (23); and

(c) said pulsator (12) consists of first and second valves (14', 15');

(d) said first valve (14') has a first valve piston (30) for mixed pressure formation which separates a first valve chamber (34) from a second valve chamber (31), said first valve chamber (34) being connected to the sensor (8) via a first volume (24') and said first nozzle (13), said first valve chamber (34) being open to atmosphere via a third nozzle (21), and said second valve chamber (31) being open to atmosphere;

(e) a first valve seat (32) in said first valve chamber (34) monitored by said first valve piston (30) and connected to said brake pipe (BP) via a second volume (24) and said second nozzle (23), and a first spring (31') in said second valve chamber (31) which loads said first valve piston (30) in the direction of said first valve seat (32);

(f) said second valve (15') has a second valve piston (33) which separates a third valve chamber (35) from a fourth valve chamber (38), said third valve chamber (35) being linked to atmosphere via a fourth nozzle (37);

(g) said fourth valve chamber (38) is open to atmosphere, in said third valve chamber (35) there is a second valve seat (36) controlled by said second valve piston (33) and connected to said first valve cavity (34), in said fourth valve cavity (38) there is a second spring (38') which loads said second valve piston (33) in the direction of said second valve seat (36), said third nozzle (21) being selected with a cross-section substantially smaller than that of said fourth nozzle (37); and

(h) said pulsator releases mixed pressure impulses (BPW/QAW) at every braking level to atmosphere, while at the same time the brake pipe pressure and the control chamber pressure are reduced via said pulsator (12).

4,592,599

HYDRAULIC BRAKE SYSTEM

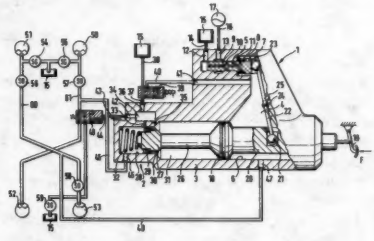
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,552

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320822

Int. Cl.[4] B60T *8/00*

U.S. Cl. 303—119 **5 Claims**



1. A hydraulic brake system for automotive vehicles, said system comprising:

a hydraulic power booster connected with a master cylinder; said booster including a pressure chamber;

a pedal actuated brake valve modulating an auxiliary fluid pressure in said pressure chamber in correlation with a force applied to a brake pedal;

wheel brakes comprising a first circuit and being connected with said pressure chamber;

wheel brakes further comprising a second circuit and being connected with said master cylinder;

valve means controlling a fluid flow to each wheel brake in correlation with a wheel brake slip;

said valve means including a device regulating a fluid flow distribution to said circuits;

said valve means hydraulically connecting said pressure chamber with said master cylinder;

wheel brakes of each of said circuits being diagonally op-

posed and said circuits forming an X-like pattern of fluid distribution during regular brake operation; a pair of wheel brakes connected to one axle and coupled with respective circuits during regular brake operation; said device redistributing fluid flow in a Y-like pattern during a brake slip control operation of said brake system and interconnecting said pair of wheel brakes.

4,592,600

MAGNETIC TAPE CASSETTE BOX

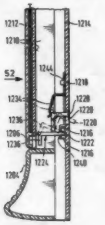
Klaus Bohnet, Lutzenhardter Muhle, D-7244 Waldachtal 3, Fed. Rep. of Germany, and Peter Ackeret, Allmendstr. 18, CH-8700 Kusnacht, Switzerland

Continuation of Ser. No. 488,022, Apr. 25, 1983. This application May 3, 1985, Ser. No. 729,904

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215721

Int. Cl.[4] A47B *87/00*

U.S. Cl. 312—12 26 Claims



1. A storage device for storing flat recording media carriers, such as magnetic tape cassettes, comprising:

a housing having a front wall,

at least one compartment positioned in said housing,

each said compartment being configured to receive a media carrier therein,

said front wall having an opening for each said compartment,

a transport means for each said compartment adapted to support a media carrier and movable between a first position wherein said media carrier is inserted in one said compartment such that it is generally unexposed and a second position wherein said media carrier is exposed permitting removal of said media carrier from said compartment,

each said compartment opening permitting movement of said transport means between said first and second positions,

said transport means having a front part exhibiting a surface configured to cover its said compartment opening so as to form part of said front wall when said transport means is in said first position,

an indicating means for indicating, when said transport means is in said first position, if a media carrier is contained therein,

said transport means having a rear part to which said front part is pivotably connected,

said rear part being adapted to support said media carrier,

said indicating means being mounted on said front part,

said indicating means being actuated, with a media carrier on said rear part, upon pivotal movement of said front part into a position in which it is aligned with said compartment opening, and

said front wall having a window positioned and configured to expose said indicating means for optical recognition of said indicating means from the exterior of said housing.

4,592,601

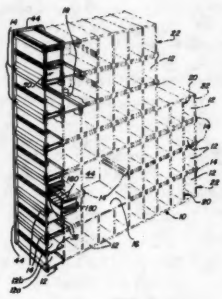
EXPANDABLE MODULAR STORAGE SYSTEM

Emil J. Hlinsky, Oak Brook, and Keith Hellon, Libertyville, both of Ill., assignors to MacLean-Fogg Company, Mundelein, Ill.

Filed Aug. 3, 1984, Ser. No. 637,571

Int. Cl.[4] F16B *12/00*

U.S. Cl. 312—111 32 Claims



1. An expandable, modular storage system, comprising:

at least one storage compartment formed by a first wall element having a first wall with a pair of parallel, facing, opposite second walls integrally joined along opposite edge portions of said first wall extending normal thereto and having free outer edge portions; and

a second wall element having opposite edge portions detachably interlockable with said free outer edge portions of said second walls to complete four sides of said storage compartment, said free outer edge portions of said first wall element and said opposite edge portions of said second wall element including at least one pair of cooperating tongue and groove elements on said respective first and second wall for providing said detachable interlockable engagement between edge portions thereof.

4,592,602

MODULAR MOUNTING RACK SYSTEM OF VERTICAL-TYPE CONSTRUCTION

Manfred Kuster, Opfikon, and Paul Weiss, Härkingen, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Jun. 8, 1984, Ser. No. 619,563

Claims priority, application Switzerland, Jun. 28, 1983, 3527/83

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—223 11 Claims

1. A modular system for a cabinet-like structured mounting rack of vertical construction for supporting a predetermined number of electronic units, said modular system comprising:

a substantially box-like rear wall module defining a cavity therein and having an end face;

said cavity being structured to receive a predetermined number of wiring cables leading to related ones of the electronic units;

a frame module releasably mounted to said end face of said rear wall module;

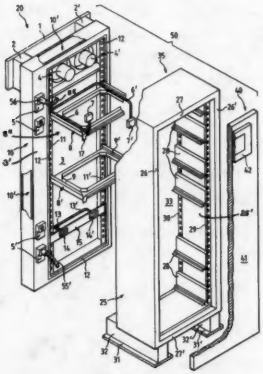
said rear wall module being provided at said end face thereof with a clearance extending over a major portion of the area of said end face;

said rear wall module defining a predetermined number of wiring planes located one above the other;

said rear wall module being provided with a predetermined number of support elements, each of which is associated with a related one of said wiring planes and supports at least one cable of said wiring cables;

said rear wall module being further provided, in a region

adjacent said clearance, with a predetermined number of connection members each of which is connectable to related external lines and to a related one of said wiring cables;



said frame module containing an inner region and therein a multitude of support rails for supporting a related one of said electronic units; and

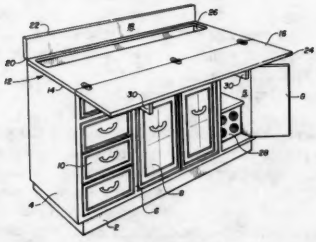
said connection members at said end face of said rear wall module being freely accessible in the assembled state of the modular system.

4,592,603

FURNITURE SERVER/DESK

James E. Adams, High Point; Ernest T. Koontz, Jr., and Steven D. Russell, both of Thomasville, all of N.C., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Oct. 13, 1983, Ser. No. 541,588
Int. Cl.[4] A40B *85/00*
U.S. Cl. 312—241 **3 Claims**



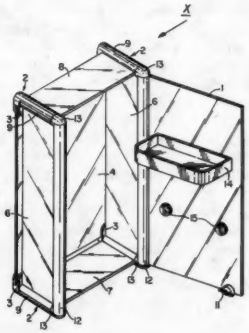
1. A furniture server/desk comprising a base with two side walls extending upwardly therefrom, a front panel having therein plural drawers and plural doors, said drawers extending into the area between the two side walls, said doors covering cavities within the two side walls, said server/desk having a top section consisting of a first part mounted above the two side walls and the front panel, said first part having a front edge on the top of the front panel and a back edge, a second part hinged thereto and overlying said first part, a third part hinged thereto and overlying said first part, said two hinged parts normally resting upon the first part with one hinged part being attached to the front edge of the first part and the other hinged part being attached to the back edge of the first part, said two hinged parts together in a side-by-side relationship resting on the first part and together forming a surface being the same size as the first part, said hinged part fastened to the back edge of the front part being approximately one-third to one-fourth the width of the hinged part fastened to the front edge of the first part, a cavity being positioned below and covered by the third hinged part, the second hinged part extending out over the front panel and being supported in position in the same plane as the first part to serve as a desk top.

4,592,604

PIECE OF FURNITURE, PARTICULARLY CABINET

Rudolf Wilke, Marsberger Str. 2, D-3548 Arolsen, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,649
Int. Cl.[4] E05D *5/04*
U.S. Cl. 312—245 **14 Claims**



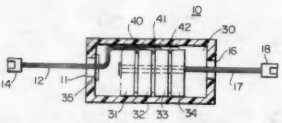
1. A piece of furniture, particularly a cabinet, comprising: at lease one bottom plate, one top plate being parallel with said bottom plate and two side walls being parallel with each other and being arranged with an angle with respect to said bottom and top plate, said plates and walls having supporting ends at opposite sides thereof: at least four spaced and parallel supporting arms for connecting and supporting said plates and walls, each supporting arm having a front and a rear end, a receiving opening bordering the front end and at least two elongated first slots extending between said front and rear ends for receiving respective ones of said supporting ends of said plates and means such that said plates and walls form said furniture and define at least one opening thereof; a door having at least one door leaf with a side edge, said door leaf being supported by two selected ones of said supporting arms; at least one bearing body having two mounting ends, extending between said selected supporting arms and having a second elongated slot receiving and concealing said side edge of said door leaf, said side edge being adjustably mounted within said second slot for adjustment of the door leaf with respect to said plates and walls; and at least two hinges each having a hinge axis, said hinges rotatably supporting said bearing body between said selected arms, each hinge having a frame portion including a bearing pin one end of which is inserted into and held within the receiving opening of one of said selected supporting arms and the other end of which projects from said last-mentioned receiving opening, and a leaf portion being provided at each of said ends of said bearing bodies and being connected to said projecting end of a respective one of said frame portions in a manner rotatably about the respective hinge axis such that said bearing body together with said door leaf may be rotated for opening and closing said opening.

4,592,605

APPARATUS FOR PREVENTING THE TWISTING OF AN ELECTRICAL CORD OR CABLE

Albert W. Kapler, 6 Travers Ave., Edison, N.J. 08817

Filed Feb. 11, 1985, Ser. No. 700,617
Int. Cl.[4] H01R *39/12*
U.S. Cl. 339—8 R **21 Claims**



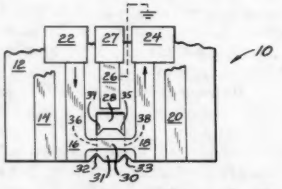
1. Apparatus for preventing the undesirable twisting of an input wire or cable of a given length and of the type capable of twisting or coiling during use comprising: a housing having an input port and an output port and having an internal hollow, with said input wire directed into said hollow via said input port, a conductive ball bearing assembly having an outer and an inner race and operative to rotate with respect to one another about a common axis, with a central aperture associated with said inner race, with said outer race rigidly secured to said housing and having electrically coupled thereto said input wire, a plate located and positioned within said central aperture and fabricated from a conductive material, said plate electrically mounted to said inner race and having electrically attached thereto an output wire directed from said plate through said output port, said plate being of a partial circular configuration to therefore occupy a portion of said central aperture, and a rod coupled to said plate and extending within said housing, said output wire directed about said rod at a portion thereof, whereby if said output wire twists said inner race, plate and rod will rotate about said common axis to maintain said output wire in a non-twisted state.

4,592,606

BREAKAWAY JUMPER EDGE CONNECTOR

Robert E. Mudra, Glenview, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 20, 1984, Ser. No. 652,935
Int. Cl.[4] H01R *29/00*
U.S. Cl. 339—31 R **18 Claims**



1. A breakaway jumper edge connector arrangement for use in a first or second mode of operation on a printed circuit board, said arrangement comprising:

first and second spaced conductors positioned on the circuit board adjacent to an edge thereof and adapted to receive an edge connector for providing electrical coupling therebetween;

an aperture in the circuit board located intermediate said first and second conductors,

a breakaway section of the circuit board located intermediate said first and second conductors and said aperture and said edge of the circuit board and adapted for easy removal therefrom;

a third conductor positioned on said breakaway section of the circuit board and electrically coupling the first and second conductors in said first mode of operation, wherein the first and second conductors may be electrically coupled by means of said edge connector with said breakaway section and said third conductor thereon removed from the circuit board in the second mode of operation; and

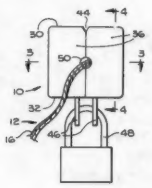
first stress concentrators positioned on said edge of the circuit board for directing a force applied to the circuit board in removing said breakaway section therefrom toward said aperture in facilitating the removal of said breakaway section.

4,592,607

ELECTRICAL CONNECTOR PLUG CONTROL

Radovan Pejovic, 5855 N. Sheridan Rd. - Apt. 12-K, Chicago, Ill. 60660

Filed Feb. 1, 1985, Ser. No. 697,248
Int. Cl.[4] H01R *13/44*
U.S. Cl. 339—37 **1 Claim**



1. A control device for controlling the use of a connector plug on an electrical cord, the plug being of substantially greater transverse dimensions than the cord, and in the use of which the plug is plugged into a connector counterpart, comprising,

a casing made up of a pair of equal-sized parts connected together for movement between a closed position and an open position,

the parts each being in the form of a shell having an open side and being otherwise generally closed, and each including a center section constituted by a channel piece having a web and flanges, and open ends, and end pieces secured to the channel piece and closing the open ends, the end pieces being welded to the channel piece and thereby forming a unitary and effectively integral said part,

the parts when in open position enabling the placement of the plug into the space generally between the parts, and the parts being capable of being moved to closed position with the plug so placed, and when so moved to closed position, completely enclosing the plug, and at least one of the parts having a small recess in one of said end pieces at its open side which, when the parts are in closed position, forms an opening for receiving the cord but which prevents movement of the plug therethrough,

the parts when in closed position having their open sides lying in a common plane and interfacing, and having outer surfaces extending generally in common direction across said common plane,

the casing including hinge means secured to the inner surfaces of corresponding flanges of the channel pieces,

the meeting edges of said corresponding flanges having beveled surfaces accommodating movement of the parts to open

the device including means for releasably locking the parts in closed position,

whereby to prevent the use of the plug for connection with a connector counterpart.

4,592,608

CONNECTOR FOR MEMORY CARDS

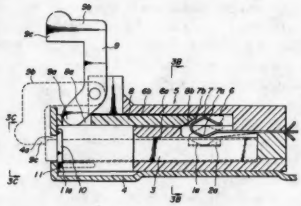
Hiroo Ohtsuka, Utsunomiya, and Tomonari Ohtsuki, Mooka, both of Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,300

Claims priority, application Japan, Dec. 14, 1983, 58-191497[U]

Int. Cl.[4] H01R *13/629*

U.S. Cl. 339—42 8 Claims



1. A connector for memory cards of the type having a connecting portion for connection of the card to a computer circuit or the like, said connector comprising:

A. a housing having an opening for receiving said memory card;

B. at least one contact element for connection of the inserted card to said circuit, wherein said contact element is arranged so as normally to be not in contact with said connecting portion;

C. a contact operating plate movable within said housing to bring said contact element into contact with said connecting portion; and

D. operating lever means pivotally connected to said housing, said lever means having one end extending from a pivot point thereof towards said housing, said end projecting into an aperture formed in said contact operating plate such that said lever means displaces said contact operating plate upon pivotal motion of said lever means, said lever means having a card-restraining body angularly extending therefrom, said body arranged to engage and restrain one end of said memory card inserted into said housing when said lever means has been pivotally rotated to move the contact operating plate and bring said contact element into contact with said connecting portion of said card, thereby preventing inadvertent removal of said card.

4,592,609

ELECTRICAL CONNECTOR

Junichi Kasai, Yokosuka, and Takehiko Saito, Yamato, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Niles Parts Company, Limited, Tokyo, both of, Japan

Filed Mar. 9, 1984, Ser. No. 587,915

Claims priority, application Japan, Mar. 24, 1983, 58-49279; Mar. 24, 1983, 58-49280

Int. Cl.[4] H01R *13/453*

U.S. Cl. 339—42 12 Claims

1. An electrical connector comprising a male assembly and a female assembly matingly receiving said male assembly:

(a) said male assembly comprising:

(1) a male member;

(2) a first electrical terminal means provided on said male member;

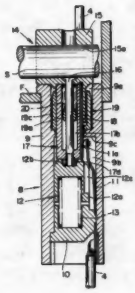
(3) a first protective member provided on said male member for protecting said terminal means from oxidation and/or deposition of dust, said protective member being movable relative to said terminal means such that said terminal means is exposed by said protective member when said male and female assemblies are mated and such that said terminal is covered by said protective member when said male and female assemblies are separated; and

(b) said female assembly comprising:

(1) a female member for matingly receiving said male member;

(2) a second electrical terminal means provided in said female member; and

(3) a second protective member provided in said female member for protecting said second terminal means from oxidation and/or deposition of dust, said second protective member being movable such that said second terminal means is exposed by said second protective member to allow electrical connection with said first terminal



means when said male and female assemblies are mated and that said second terminal means is covered by said second protective member when said male and female assemblies are separated;

said male member including a rod-like guide, said first protective member including a hollow columnar portion slidable along said guide, said male member including a hollow stem having a plurality of slits extending along the axis of said stem, said protective member including a ring-like core which fits slidably over said rod-like guide and is coaxial with said hollow portion, a plurality of radial arms connecting said hollow portion and said ring-like core, said radial arms being slidably received in the corresponding slits of said stem.

4,592,610

PRINTED CIRCUIT CARD FRAME ASSEMBLY

Thurman A. Bowls, New Smyrna Beach, Fla., assignor to General Electric Company, Syracuse, N.Y.

Filed May 4, 1984, Ser. No. 607,266

Int. Cl.[4] H01R *13/20;* H05K *7/14*

U.S. Cl. 339—65 14 Claims

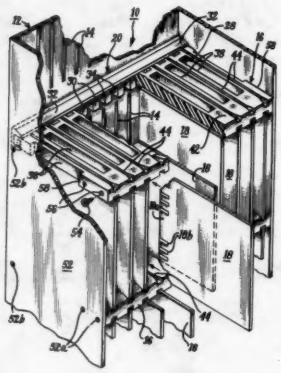
1. A frame assembly for housing removable printed circuit cards, said frame assembly comprising, in combination:

A. a backplane;

B. at least a pair of elongated supports affixed to the front side of said backplane in vertical spaced relation, each said support including support tongues spaced along substantially the entire support length, the spaces between said support tongues serving to define a series of support grooves, and an opeing formed in each said support tongue, said openings being in alignment along the support length;

C. a shelf for each said support, each said shelf including a plurality of laterally spaced, elongated rails arranged perpendicular to said backplane, said each rail having a substantially coextensive card guide track formed in at least one of its upper end lower edge surfaces, a forward wall interconnecting the frontal end portions of said rails, a rear wall interconnecting the rearward end portions of said rails, a series of tongues projecting rearwardly from

said rear wall and spaced along substantially the entire shelf length, the spaces between said shelf tongues serving to define a series of shelf grooves, and an opeing formed in each said shelf tongue, said openings being in alignment along the shelf length, whereby said sheles are assembled to said supports by nesting said shelf tongues in said support grooves and said support tongues in said shelf grooves such that said support and shelf tongues are interleaved; and



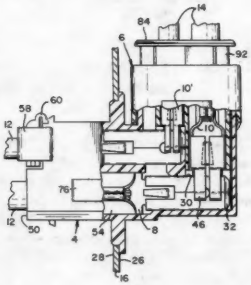
D. a retainer rod inserted through said openings in said interleaved support and shelf tongues of each support-shelf assembly.

4,592,611

ELECTRICAL CONNECTOR INTENDED FOR USE IN CONFINED AREAS

Reinhard Nitschke, Frankfurt am Main, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 27, 1984, Ser. No. 655,121
Int. Cl.[4] H01R *13/62*
U.S. Cl. 339—91 R **7 Claims**



1. A panel mount electrical connector assembly intended for use in confined spaces comprising first and second connector housings having first and second terminals therein respectively, each of the housings having a wire entry face and a mating face, the terminals extending from the mating faces of the housings, the mating faces being substantially against each other and the contact terminals being engaged with each other when the first and second housings are assembled to each other, wires extending into the wire entry faces of the housings and to the terminals, the wires being connected to the terminals, the connector assembly being characterized in that:

the connector assembly is substantially L-shaped, the first housing being one of the arms of the L and the second housing being on the other arm, the mating faces of the first and second housings being at the junction of the arms, the wire entry faces being at the ends of the arms,

the first terminals in the first housing comprising rectangular blade terminals having side edges and having oppositely facing major surfaces between the side edges, the terminals in the second housing comprising blade receptacle terminals,

the blade terminals being mounted in two parallel rows in the first housing and the receptacle terminals being mounted in two parallel rows in the second housing, each of the terminals having a free end which is spaced from the mating face of its respective housing, the free ends of the terminals in one of the rows in each of the housings being located beyond the free ends of the terminals in the other row,

one of the housings being mountable in an opening in a panel so that the wire entry face of the one housing is on one side of the panel and the mating face is on the other side of the panel whereby,

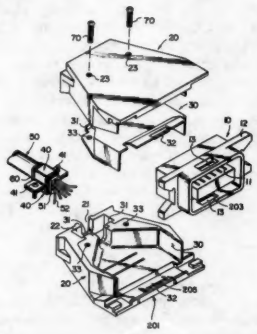
upon mounting the one housing in the opening in the panel and mating the other housing with the one housing, the mating faces of the housings will be adjacent to the other side of the panel and the other housing will extend substantially parallel to the other side of the panel.

4,592,612

ELECTRIC CONNECTOR HAVING COVER CASE

Sigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,103
Claims priority, application Japan, Jan. 23, 1984, 59-7490[U]
Int. Cl.[4] H01R *13/46*
U.S. Cl. 339—143 R **1 Claim**



1. An electric connector comprising:

a nonconductive connector body having:

contacts arranged therein;

a coupling portion adapted to be coupled to a mating conductive connector shell; and,

a rear end portion accommodating the wire connecting parts of said contacts;

a pair of cover case halves forming a nonconductive cover case when coupled to each other;

a pair of shielding case halves forming a conductive shielding case when coupled to each other and when coupled to a shield cable clamp member;

said coupling portion of said nonconductive connector body being provided in at least one side wall of the coupling portion with a shield contact tongue hole through the side wall;

each of said cover case halves having a gripping piece at the front end thereof, said gripping pieces of said cover

case halves being adapted to grip both sides of said nonconductive connector body to hold said nonconductive connector in place in such a manner that at least said shield contact tongue hole can be covered by the gripping pieces when said cover case halves are coupled to each other;

each of said cover case halves having a first recess and a second recess, said first recess having an open end adjacent to said gripping piece, said open ends of said first recesses being adapted to form an opening for receiving a rear end portion of said nonconductive connector body when said cover case halves are coupled to each other, said second recess being adapted to form a clamp member receiving cavity for accommodating said sheilded cable clamp member when said cover case halves are coupled to each other, the rear end of said first recess communicating with the front end of said second recess through a passage adapted to receive said shielded cable, the rear end wall of said second recess having a notch formed therein, the notches of said cover case halves being adapted to form an opening for receiving said shielded cable when said cover case halves are coupled to each other;

each of said shielding case halves being adapted to be disposed within said first recess of said corresponding cover case halves so as to extend over substantially all of the inner wall surfaces of said first recess except said open end and said passage;

at least one of said shielding case halves being provided at the front end thereof with a resilient shield contact tongue, said shield contact tongue to extend along and between said gripping piece of said corresponding cover case half and said side wall of said coupling portion of said nonconductive connector body held therein, said shield contact tongue having an inwardly convexed contact point to enter into said shield contact tongue hole and protrude slightly and inwardly beyond the inner surface of said side wall of said coupling portion so as to make contact with said mating conductive connector shell when coupled to said coupling portion of said nonconductive connector body, the front end of said shield contact tongue being adapted to be covered by the front inner wall of said shield contact tongue hole in the coupling direction of said mating conductive connector shell;

said shielded cable clamp member being adapted to make electrical contact with the shielding wire of said shielded cable and then be placed in said clamp member receiving cavity;

said shield case halves being provided at the rear end thereof with at least one clamp member contact lug which can be located along the front inner wall of said second recess, the front end face of said clamp member adapted to be brought into pressed contact with said clamp member contact lug located along the front inner wall of said clamp member receiving cavity when said clamp member is pressed into said clamp member receiving cavity.

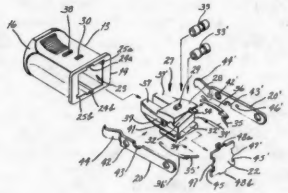
4,592,613

REPLACEABLE FUSE ADD-ON PLUG

George K. K. Tong, Hong Kong, Hong Kong, assignor to Chane Hwa Manufacturing Co. Ltd., Hong Kong; Tung Ming Electrical Co. Ltd., Taipei, Taiwan and Chane Hwa Electrical Co. Ltd., Tapiei, Taiwan

Filed Oct. 25, 1984, Ser. No. 664,578
Int. Cl.⁴ H01H *85/02*
U.S. Cl. 339—147 P **10 Claims**

1. A fused plug including a body shell and a pair of plug blades extending forwardly from the body shell in spaced-apart relation, characterized by the body shell being of integral, one-piece molded construction and including a recess opening forwardly, a fuse site body slidably receivable within the recess, the fuse site body defining fuse-receiving recess means accessible through the recess opening for receiving a pair of fuses, with one end of each of the fuses in electrical contact with a respective plug blade and for providing for electrical connection of wire leads with the opposite ends of the fuses, said leads extending from the body shell, the fuse site body defining blade-receiving recesses at opposite sides for readily receiving and removing the plug blades, the plug blades each defining an aperture, the fuse site body including lateral projections within the blade-receiving recesses for being received



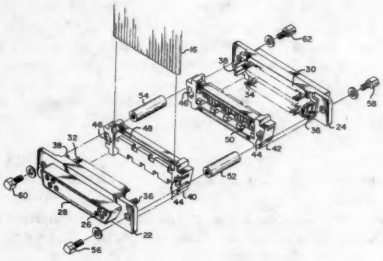
by the apertures of the plug blades, thereby for locking the plug blades to the fuse site body in mutually secured relationship, and means for locking the fuse site body within the body shell in mutually secured relationship, and a cover separate from the fuse site body for covering the recess opening, whereby the user is prevented from having access to the fuses without first unplugging the plug blades from an electrical receptacle.

4,592,614

GENDER CHANGE CONNECTOR

Earl C. Myers, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 415,285, Sep. 7, 1982, abandoned. This application Aug. 2, 1984, Ser. No. 636,951
Int. Cl.⁴ H01R *13/50*
U.S. Cl. 339—154 A **4 Claims**



1. An electrical connector assembly for electrically interconnecting connectors of like gender, said assembly comprising:

a pair of identical electrical connectors each of the type comprising an elongate housing having a mating face, an opposed rear surface, a mounting flange having opposed ends with a hole therethrough at each opposed end, and a plurality of terminals mounted therein, each terminal having an insulation displacing conductor engaging portion extending from said rear surface,

each connector further comprising a cable cover latched against the rear surface of the housing, each said cover having a plurality of passages therein which receive respective conductor engaging portions of said terminals,

a short length of multiconductor ribbon cable terminated at each end thereof to one of said pair of connectors, each conductor in said cable being terminated at opposite ends to respective terminals, said cable being retained therewith by said cable covers,

hardware engaging said holes in said flanges to secure said

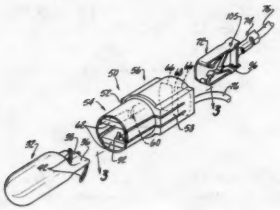
pair of connectors substantially together in back-to-back relationship with said cable covers adjacent to each other and said mating faces opposed to each other, each hole being aligned with a respective hole of the other connector of the pair, said hardware comprising a pair of cylinders received between flanges at opposite ends of said back-to-back connectors, each cylinder having a tapped hole at each end thereof which is aligned with a respective hole in one of said flanges, said hardware further comprising bolt means received in said tapped holes through said flanges to secure said connectors in back-to-back condition.

4,592,615

FOLDED REDUNDANT TERMINAL

Remie P. Durand, Fraser, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 3, 1985, Ser. No. 752,265
Int. Cl.[4] H01R *13/50*
U.S. Cl. 339—176 L **3 Claims**



3. A snap-in terminal and socket assembly for receiving, locating and positioning a wedge-base bulb having a pair of filament extension wires positioned on the sides of the wedge-base, a pair of troughs extending transverse to the wedge base, the wedge bulb further having a centrally located cylindrical vent tube and a bulbular evacuated chamber both in the same longitudinal axis, the vent tube bounded by laterally extended side wings of the base, the snap-in lamp terminal and socket assembly comprising:

a lamp receiving portion and a conduit receiving portion;

the conduit receiving portion including wire retention means;

the lamp receiving portion of a generally channelized shape having a terminal base and terminal sides forming the channel;

cantilevered contact arms projecting into the interior of the generally channelized lamp receiving portion from the terminal side via folded tabs;

the contact arms including spring contact members for communication with the detent troughs of the bulb and filament wires of the bulb;

the terminal sides having curved bulb guides at the lamp receiving end to communicate with the wedge-base bulb;

a wire guide means projecting into the interior of the generally channelized lamp receiving portion from one of the terminal sides such that a wiping action will occur when the wedge-base bulb is inserted into the terminal whereby the wire guide means wipes along the vent tube of the bulb thereby straightening any skewed portion of the filament wires;

a generally tubular shaped socket for receiving the wedge-base bulb and the snap-in terminal;

the socket comprising a bulb housing section and a terminal access chamber for a pair of snap-in terminals;

the bulb housing section being of generally cylindrical shape and having a pair of end stops which define a bulb entrance to the housing;

a pair of terminal guides slotted through the terminal access chamber and bulb housing terminating with the end stops in the bulb housing;

terminal guide ports providing access to the terminal guides for the snap-in terminals;

the bulb housing further comprising wedge clamps hinged from the socket assembly and providing a wedge for communication with the terminal base wedge receiving slot thereby entrapping the snap-in terminal; and

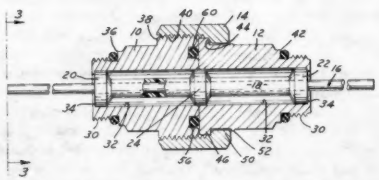
redundant terminal means comprising a folded redundant terminal formed from the terminal side of the lamp receiving portion of the snap-in terminal and affixed to the side by a folded tab, the folded redundant terminal being bent from the tab toward the contact arm designed to make contact with the filament wire until the folded redundant terminal is in the same longitudinal axis as that of the snap-in terminal.

4,592,616

CONNECTOR FOR COAXIAL TELEVISION CABLE

Thomas J. Drew, New Baltimore, and Frank S. Day, Detroit, both of Mich., assignors to Armex Cable Corporation, Warren, Mich.

Filed Mar. 15, 1984, Ser. No. 591,398
Int. Cl.[4] H01R *17/04*
U.S. Cl. 339—177 R **2 Claims**



1. For use with coaxial cable television line housings which are formed of conductive metal, closely spaced, and each having aligned threaded recesses, a housing-to-housing connection for the internal conductor of a coaxial television cable which comprises:

(a) a first conductive connector element having a threaded end to be received in a threaded recess of one housing and having a central bore, said bore having an inturned lip at the outer end,

(b) a second conductive connector element having a threaded end to be received in a threaded recess of a second housing and having a central bore to align with the bore of said first element, said bore having an inturned lip at the outer end,

(c) means to secure said connector elements together with said bores in alignment comprising a collar engaging an annular shoulder on one element and threadingly engaging threads on an inner end of the other of said elements, and

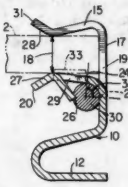
(d) a separable, integral conductor and insulator unit to be removably captured within said connector elements comprising a length of straight, solid conductor wire having a diameter much smaller than said bores to connect the internal conductor of a coaxial cable of said spaced housings and having a length to project out of the threaded ends of each of said connector elements and into said spaced housings, and an axial and radial locator molded on and bonded to said conductor wire centrally between the ends having a spool land at each end fitting within said aligned bores of said connector elements and confined axially between said lips of said bores, the intermediate portions of said locator covering said wire and having a diameter reduced from that of said bores and said spool lands.

4,592,617

SOLDER-BEARING TERMINAL

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, Flushing, N.Y.

Filed Feb. 6, 1985, Ser. No. 698,618
Int. Cl.[4] H01R *4/02*
U.S. Cl. 339—275 B 18 Claims



14. A solderable lead for connecting an electrically conductive element to a substrate or the like comprising:

a connector portion adapted for engagement with said conductive element;

a stem portion integral with said connector portion,

a discrete solder mass juxtaposed to said stem portion adjacent the end thereof,

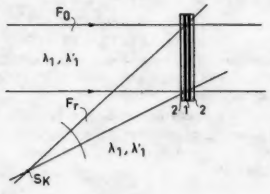
said stem portion having at least one integral tab bent outwardly therefrom and retaining said solder mass against said stem portion, said tab leaving an opening in said stem portion for flow of solder from said mass when heated to the melting point.

4,592,618

HOLOGRAPHIC RECORDING AND RELATED READING PROCESS

Jean-Pierre Huignard, and Hervé Arditty, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Jul. 2, 1982, Ser. No. 394,723
Claims priority, application France, Jul. 7, 1981, 81 13322
Int. Cl.[4] G42B *5/32*
U.S. Cl. 350—3.61 9 Claims



1. A process for recording a holographic image of an object applicable to a volume-type non-linear photoexcitable storage medium, comprising the steps of:

first recording in said medium interference patterns generated by the combination of a first incident light beam from said object and a first reference light beam, both of said first beams being of a first wavelength; and

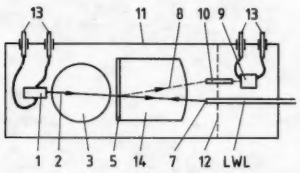
second recording in said medium interference patterns generated by the combination of a second incident light beam from said object and a second reference light beam, both of said second beams being of a second wavelength differing from said first wavelength and having identical projections as said respective first beams, thereby obtaining a non-linear mixing of said recorded interference patterns in said medium defining a holographic recording of said object.

4,592,619

OPTICAL COUPLING DEVICE

Edgar Weidel, Senden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,069
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232793
Int. Cl.[4] G02B *6/12, 6/26, 6/36, 5/30*
U.S. Cl. 350—96.11 18 Claims



1. An optical coupling device comprising:

microoptic means with spherical and plane surfaces for collimating and focusing a beam of electromagnetic radiation and a mirror element having at least one reflective planar surface with a reflection characteristic which is responsive and changes according to the wavelength of electromagnetic radiation striking said reflective planar surface, said planar surface being substantially transparent to a first beam of light at a first wavelength and being substantially opaque to a second beam of light at a second wavelength for transmitting the first beam of light and for reflecting the second beam of light;

a transmitter for generating said first beam of electromagnetic radiation which passes through said microoptics means and through said reflective planar surface substantially without loss on a first beam path;

a waveguide having a front face line on said first beam path for receiving said collimated and focused first beam, said waveguide adapted to guide said second beam of electromagnetic radiation which follows a second beam path out of said front face and against said reflective planar surface where the second beam is reflected substantially without loss along said second beam path;

a receiver lying on said second beam path for receiving said second beam; and

an optical filter which is spatially and wavelength dependent on the electromagnetic radiation and responsive to the wavelength of electromagnetic radiation lying on said second beam path between said microoptics means and said receiver.

4,592,620

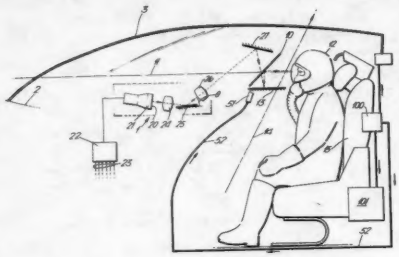
DISPLAY UNITS FOR AIRCRAFT

Brian H. Poole, Cheltenham, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jan. 29, 1985, Ser. No. 696,216
Claims priority, application United Kingdom, Feb. 18, 1984, 8404314
Int. Cl.[4] G02B *27/10*
U.S. Cl. 350—174 10 Claims

1. A display unit for an aircraft of the kind having an ejector seat that can be ejected out of the aircraft within an ejection envelope, the display unit including display means, mounting said display means forwardly of the user outside the ejection envelope to provide a display of an image to the user, and an optical system that projects the image from the display means into the field-of-view of the user, said optical system including an optical element that, in use, extends into the region of the

said ejection envelope, and actuator means operable to displace said optical element relative to said display means away from



the ejection envelope in response to operation of the ejector seat so as thereby to facilitate safe ejection of the user.

4,592,621

ACOUSTOOPTIC MODULATION ELEMENT AND SYSTEM FOR ACOUSTOOPTICALLY CARRYING OUT MODULATION OF A PLURALITY OF PARALLEL BEAMS BY THE USE OF A SINGLE ACOUSTOOPTIC MEDIUM

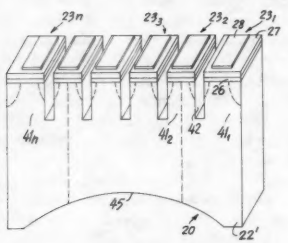
Satoru Amano, Nirasaki; Shigenori Horiuchi, and Takeru Shinohara, both of Yamanashi, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,346

Claims priority, application Japan, Jul. 27, 1982, 57-129656; Jul. 27, 1982, 57-129657; Jul. 27, 1982, 57-129658; Jul. 27, 1982, 57-129659

Int. Cl.[4] G02F *1/33*

U.S. Cl. 350—358 **5 Claims**



1. An acoustooptic modulation element responsive to a plurality of input light beams extending substantially parallel to one another and to electric signals equal in number to said input light beams for emitting output light beams, respectively, said acoustooptic modulation element comprising:

a single acoustooptic medium block having a first surface, a second surface opposite said first surface, and a plurality of plateaus which are equal in number to said input light beams and which are arranged in parallel between said first and said second surfaces so that a channel is left between two adjacent plateaus, each of said input light beams being incident on one of said plateaus at said first surface while said output light beams exit from said plateaus at said second surface;

a plurality of transducing means each of which is mounted on one of said plateaus extending between said first and said second surfaces in the travel direction of said input light beams and each of which is responsive to one of said electric signals, for individually transducing each said electric signals into an acoustic wave which is propagated into one of said plateaus to cause the output light beams at said second surface to be modulated by said acoustic waves when said electric signals are applied to the respective transducing means.

4,592,622

LIGHT-BEAM SCANNING APPARATUS

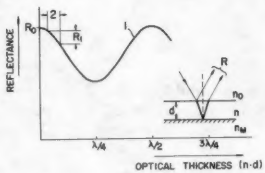
Akira Hashimoto, Hitachi; Susumu Saito, Hachioji; Akira Arimoto, Musashimurayama, and Kenji Morita, Hachioji, all of Japan, assignors to Hitachi Koki Co., Ltd. and Hitachi Ltd., both of Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,210

Claims priority, application Japan, Mar. 23, 1983, 58-47050

Int. Cl.[4] G02F *1/00*

U.S. Cl. 350—395 **20 Claims**



4. A light-beam scanning apparatus comprising:

a mirror with a reflecting surface made of metal for reflecting a light incident at an incident angle of not more than 70°,

an anodic oxide film formed on said reflecting surface and having an optical thickness n d substantially equal to $m\lambda/2$ (wherein n, d, m, λ indicate the refractive index of said oxide film, the thickness of said oxide film a positive integer, and the wavelength of said incident light, respectively), and

means for deflecting said reflecting surface, said incident light being near polarized light and the direction of vibration of said linear polarized light being inclined at an angle of about +40° to −40° to a direction perpendicular to the plane of incidence of said linear polarized light in response to the thickness of said oxide film so that the intensity of light reflected from said reflecting surface is maintained substantially constant in a scanning range.

4,592,623

POLARIZING PLATE

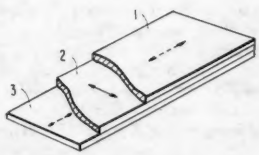
Suguru Yamamoto; Kazuaki Sasa, and Toshihiko Sugimoto, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 22, 1983, Ser. No. 534,868

Claims priority, application Japan, Sep. 22, 1982, 57-165700

Int. Cl.[4] G02B *5/30*

U.S. Cl. 350—397 **15 Claims**



1. A polarizing plate comprising a polarizing film and a protective layer bonded through an adhesive layer to at least one surface of the polarizing film, wherein the protective layer is a polyester film in which the minimum and maximum refractive indices, n_x and n_y respectively, in directions parallel to the plane of the film and the refractive index n_z in the direction perpendicular to the plane of the film thickness satisfy the equation

$$[(1/n_y^2)-(1/n_x^2)/(1/n_y^2)-(1/n_z^2)]^{\frac{1}{2}}>1/n$$

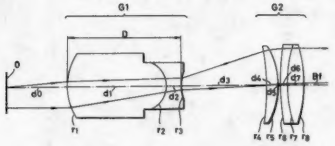
and the relative optical path length difference is about or greater than 10 μm wherein n_y is the one of said minimum and maximum indices closest in value to n_z and n is the average refractive index of said polyester film.

4,592,624

OBJECTIVE LENS FOR MICROSCOPE OF LOW MAGNIFICATION

Kazuo Ushida, Tokyo; Masashi Tanaka, Yokohama, and Yoshiyuki Shimizu, Miura, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,928
Claims priority, application Japan, Nov. 22, 1983, 58-219799
Int. Cl.[4] G02B *9/12, 21/02*
U.S. Cl. 350—414 **11 Claims**



1. An objective lens for a microscope of low magnification, capable of reducing flare and providing a high image contrast even with coaxial reflective illumination, comprising, in the order from the object side:

a converging front lens group including a meniscus lens component convex to the object side, said meniscus lens component being composed of a biconvex positive lens and a biconcave negative lens which are cemented together with a cemented lens surface convex to the image side, said cemented lens surface having divergent refractive power, and the convergent refractive power of the object side lens surface of said biconvex positive lens being smaller than the sum of the absolute values of the divergent refractive power of the cemented lens surface and the divergent refractive power of the image side lens surface of said biconcave negative lens; and

a converging rear lens group including a positive lens component having a surface of stronger curvature positioned toward the image side and a biconvex positive lens component.

4,592,625

DOUBLE-CONJUGATE MAINTAINING OPTICAL SYSTEM

Makoto Uehara, Tokyo; Satoru Anzai, Zama, and Kyoichi Suwa, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 469,015
Claims priority, application Japan, Mar. 4, 1982, 57-34366
Int. Cl.[4] G01B *11/00*; G02B *13/22*
U.S. Cl. 350—415 **22 Claims**

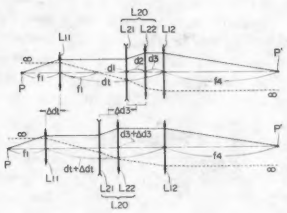
1. A double-conjugate maintaining optical system for maintaining the conjugate relation between an object and its image in a predetermined constant magnification and also maintaining the conjugate relation between an entrance pupil and an exit pupil in a predetermined condition even if the distance between said object and said image varies, including:

an afocal system comprising two lens units disposed with a constant spacing therebetween corresponding to the sum of the focal lengths thereof, said afocal system being movable along the optical axis thereof while maintaining the constant spacing between said two lens units;

a first positive lens unit disposed on the object side of said afocal system; and

a second positive lens unit disposed on the image side of said afocal system;

said first positive lens unit being movable relative to said second positive lens unit along the optical axis thereof so



that said object is positioned on the focal plane of said first positive lens unit opposite to said afocal system;

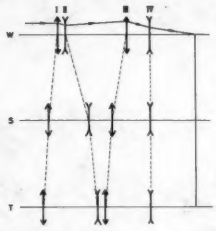
said afocal system being movable relative to said second lens unit along the optical axis thereof in a predetermined relation to the amount of relative movement of said first positive lens unit with respect to said second positive lens unit.

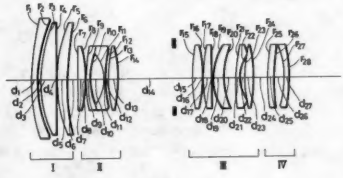
4,592,626

COMPACT ZOOM LENS SYSTEM

Tooru Fujii, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 446,418, Dec. 2, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 670,123
Claims priority, application Japan, Dec. 8, 1981, 56-196283
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 **21 Claims**





1. A compact zoom lens system, comprising:

four lens groups, first, second, third and fourth, wherein said first lens group has positive refractive power and is arranged as a compensator, said second lens group has negative refractive power and is arranged as a variator, said third lens group has positive refractive power and is arranged as a variator, said fourth lens group has negative

refractive power and is arranged in the rearmost position; said first, second and third lens groups constituting a zooming sub-system having positive refractive power as a whole;

said compact zoom lens system permitting movement of said second lens group and said third lens group along the optical axis for the purpose of zooming;

said zoom lens system moving said first lens group in order to compensate for the movement of image surface caused when said second lens group and said third lens group are moved, wherein said first lens group and said third lens group are moved toward the object side, said second lens group are moved toward the image side and said fourth lens group are kept fixed when the focal length thereof is varied from the teleposition to the wide position, said zoom lens system being further arranged to fulfill the following conditions where reference symbol V_2 represents the magnification ratio of said second lens group between the telephoto and wide positions, and reference symbol V_3 represents the magnification ratio of said third lens group between the telephoto and wide positions

$0.5<V_2/V_3<2.0$.

4,592,627

SINGLE COLLIMATOR LENS HAVING ONE ASPHERICAL SURFACE

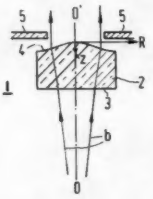
Albert Smid, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 593,003

Claims priority, application Netherlands, Dec. 7, 1983, 8304212

Int. Cl.[4] G02B *13/18, 26/10*

U.S. Cl. 350—432 **9 Claims**



1. A collimator lens having first and second opposite surfaces and an optical axis extending through the surfaces, the first surface being aspherical and the second surface being planar, said lens having a numerical aperture less than 0.25 and having a focal length between approximately 16 millimeters and approximately 24 millimeters, said aspherical surface being defined by the expression

$$Z=E_2R^2+E_4R^4+E_6R^6,$$

where R is the distance between a point on the aspherical surface and the optical axis, Z is the distance between a projection of the point onto the optical axis and the point of intersection between the optical axis and the aspherical surface, and E_2, E_4, and E_6 are constants determined by the equations

$$E_2=\frac{1}{40(n-1)}\cdot\frac{f}{20}$$

$$E_4=[(2.710893-3.626513n+1.120858n^2)10^{-4}+E_2^3]\left(\frac{f}{20}\right)^3$$

$E_6=$

-continued

$$[(2.825115-3.1865364n+0.8904979n^2)10^{-6}+E_2^5]\left(\frac{f}{20}\right)^5$$

where n is the refractive index of the lens, and where f is the focal length, in millimeters, of the lens.

4,592,628

MIRROR ARRAY LIGHT VALVE

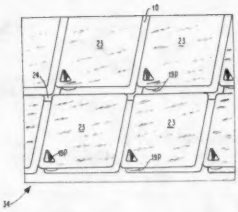
Carl Altman, Lagrangeville; Ernest Bassous, Riverdale; Carlton M. Osburn, Yorktown Heights; Peter Pleshko, Staatsburg; Arnold Reisman, Yorktown Heights, and Marvin B. Skolnik, Kingston, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Jul. 1, 1981, Ser. No. 279,392

The portion of the term of this patent subsequent to Mar. 3, 2002, has been disclaimed.

Int. Cl.[4] H01J *31/24*

U.S. Cl. 350—486 **2 Claims**



1. A mirror array light valve comprising an array of deformable light reflected elements, each of said elements being supported by a post member extending from a base member, said post member being straight-sided, the joint between said post and said element being at the edge of the element and being confined to a small portion of said edge,

said posts comprising hollow cylinders formed by a self-limiting etching process comprising forming a straight-sided hole in a silicon body, processing the interior surface of said hole to convert to material which is resistant to a silicon etch, and etching away the body of silicon not so converted by said processing.

4,592,629

EYEGLASS FRAMES WITH METALLIC STRIP REINFORCEMENT TRAVERSED BY HINGE ATTACHMENT SCREWS

Renato Giacomelli, Piano di Follo, Italy, assignor to Morwen s.r.l., Piano di Follo, Italy

Division of Ser. No. 121,443, Feb. 14, 1980, Pat. No. 4,443,074. This application Aug. 27, 1982, Ser. No. 412,294

Claims priority, application Italy, May 3, 1979, 21494/79[U]; Jun. 20, 1979, 23751 A/79

Int. Cl.[4] G02C *1/08, 5/12*

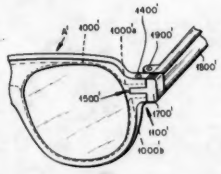
U.S. Cl. 351—41 **5 Claims**

1. An eyeglass frame comprising:

two substantially coextensive plates, sealed together to form a frame body and having a pair of spaced-apart windows adapted to receive lenses, at least one of the plates having a groove opening towards the other of said plates and closed thereby, said groove extending around said windows and across a bridge portion of the nose of the user and disposed between said windows;

a generally flat reinforcing metallic strip member received in said groove so that the width of said strip member is transverse to planes of said plates, said frame body being provided with slots at opposite ends thereof opening into

said windows opposite said bridge member, said slots each being defined by outwardly extending formations coplanar with said windows, said metallic member extending around respective windows and having ends bent outwardly along opposite sides of each of said slots and received in said formations;



a respective temple having a hinge lug received in each slot; and

a respective screw traversing a pair of said formations and the respective ends of said member and traversing each lug and holding the ends along the respective opposite sides of each slot together.

4,592,630

OPHTHALMIC LENSES

Sakiho Okazaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 180,765, Aug. 25, 1980, abandoned. This application Feb. 20, 1985, Ser. No. 702,859

Claims priority, application Japan, Aug. 24, 1979, 54-107966

Int. Cl.[4] G02C 7/06

U.S. Cl. 351—169 **10 Claims**

1. An ophthalmic lens comprising a lens body having:

a principal meridian in a substantially vertical direction and substantially in the center of the lens body;

a far vision viewing zone in the lower portion of the lens body;

a near vision viewing zone in the lower portion of the lens body;

an intermediate vision viewing zone disposed between the upper far vision viewing zone and the lower near vision viewing zone, the refractive power of the lens in the intermediate zone progressively increasing from the upper portion to the lower portion; and

the line of intersection between the refractive surface of the lens body and the plane orthogonal to the principal meridian in the lower portion of the far vision viewing zone being a non-circular curve having a curvature radius decreasing along the line of intersection as the distance from the principal meridian increases, the decreasing rate of the value of the curvature radius decreasing down to zero wherein the surface becomes spherical at the upper portion of the far vision viewing zone and thereafter remains constant;

wherein said far vision viewing zone is horizontally divided into three regions with the center region with the astigmatism within 0.5 diopters and astigmatism being greater than 0.5 diopters in the outer regions to each side of said central region, said central region having the principal meridian substantially passing through the center thereof.

4,592,631

CAMERA-EQUIPPED OPHTHALMOSCOPE

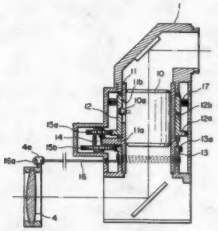
Toshiaki Nakane, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,852

Claims priority, application Japan, Nov. 2, 1983, 58-170557[U]

Int. Cl.[4] A61B 3/14

U.S. Cl. 351—206 **4 Claims**



1. A camera-equipped ophthalmoscope comprising:

a lens-barrel containing a lens and slidable in a direction of an optical axis, said lens-barrel being provided with a radially extending projection on the outer periphery thereof;

a rotary drum concentric with said lens-barrel and provided with a helical groove on the inner surface thereof for receiving said projection;

a cord-roll-up drum coaxial with said rotary drum and operatively connected thereto;

a cord with one end secured to said cord-roll-up drum; and

an objective lens connected to the other end of said cord,

whereby, according to the movement of said objective lens, said lens-barrel is slid in the direction of said optical axis so as to correct the focus.

4,592,632

MOTION PICTURE SHUTTER METHOD AND APPARATUS

Walter Renold, 7044 Mary Ellen Ave., North Hollywood, Calif. 91605

Filed Dec. 28, 1984, Ser. No. 687,027

Int. Cl.[4] G03B 9/10

U.S. Cl. 352—214 **12 Claims**

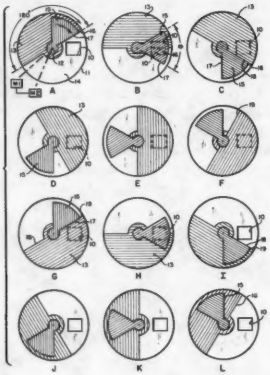
1. A method for controlling light transmission through an aperture in a motion picture apparatus, including the steps of:

(a) providing a first shutter rotatably mounted with opaque and transparent sectors alternately passing in front of said aperture;

(b) providing a second shutter coaxially rotatably mounted with said first shutter defining an opaque sector whose angle is at least equal to the angle subtended by said aperture but less than that of the opaque sector of said first shutter; and

(c) rotating said second shutter at twice the speed of said first shutter, the relative positions of said shutters being such that the leading edges of their opaque sectors are in alignment when starting to eclipse said aperture whereby said aperture is covered and uncovered at twice the speed as

would occur by use of only a single shutter having an opaque sector whose angle is at least equal to the sum of



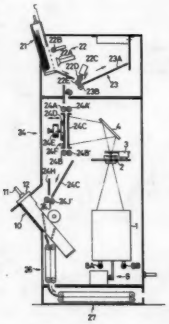
the angles of the opaque sectors of the first shutter and the second shutter.

4,592,633

PHOTOGRAPHING APPARATUS

Takatoshi Seki; Norio Ookawa; Tatsuo Yoshino, and Takashi Yamamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 13, 1984, Ser. No. 670,726
Claims priority, application Japan, Nov. 30, 1983, 58-226218
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—76 4 Claims



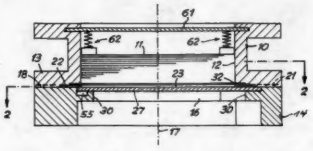
1. A photographic apparatus, comprising; an image display device for displaying an image to be photographed; an optical system for forming said image on a surface of a photographic film; film receiving magazine means for receiving exposed film; means for conveying said film to said film receiving magazine means, said film receiving magazine means comprising a selectable one of (1) a film receiving magazine; and (2) a dummy magazine; a processing station following said dummy magazine, said dummy magazine including guide means for directing film conveyed thereto to said processing station, and detecting means for discriminating between said dummy magazine and said film receiving magazine.

4,592,634

APPARATUS TO SEPARATE A SINGLE SHEET FROM A STACK OF SEVERAL SIMILAR SHEETS

Carl Koch, Stetten, Switzerland, assignor to Sinar AG Schaffhausen, Feuerthalen, Switzerland

Filed May 2, 1984, Ser. No. 606,145
Claims priority, application Switzerland, May 2, 1983, 2359/83
Int. Cl.[4] B65H *3/46;* G03B *17/24, 19/10*
U.S. Cl. 354—105 8 Claims



1. Apparatus for separating a single sheet from a stack of several sheets having the same non-round shape and the same size, said apparatus comprising a container with a recess for holding the stack, a base located underneath the container having a dispensing opening, a separating element with an aperture for receiving the bottom sheet which is to be separated from the stack, said separating element being located between the container and the base and being essentially a flat disc, the thickness of which is smaller than the thickness of a single sheet of the stack, means for rotating the container relative to the separating element on an imaginary axis passing through the recess of the container, the dispensing opening of the base and the aperture of the separating element capable of separating each bottom sheet from the stack and conveying the separated sheet into the dispensing opening of the base, the recess of the container and the aperture of the separating element conforming essentially in shape and size to one another and being of the same shape and size of the sheets of the stack when viewed in the direction of the imaginary axis, and at least one support element beneath the separating element which can be moved into an operating position where the support element supports the bottom sheet of the stack into a non-operating position where the support element allows the bottom sheet to move from the aperture of the separating element into the dispensing opening of the base, the movement of the support element from the operating position to the non-operating position being coupled with the relative rotation between the separating element and the container.

4,592,635

POWER HANDLE FOR ELECTRONIC FLASH UNIT AND REMOTE SHUTTER RELEASE DEVICE

Buddy W. Vaughn, P.O. Box 11573, Louisville, Ky. 40211

Filed May 28, 1985, Ser. No. 737,778
Int. Cl.[4] G03B *15/05, 17/38*
U.S. Cl. 354—133 4 Claims

1. A battery power handle for use with a photographic camera for tripping the shutter release button of the camera and energizing a portable flash unit, said power handle comprising:

a. a hollow elongated housing containing a plurality of dry cell batteries that are connected in series-parallel circuit;

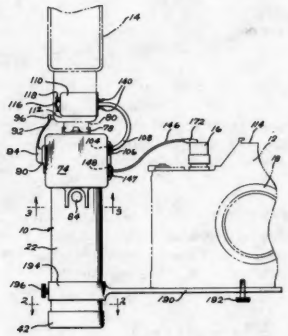
b. the top end of the elongated housing including a hollow wiring compartment that is closed at the top and is furnished with an electrical connector for receiving and holding a mating electrical connector of a portable electronic flash unit that is attached to the top end of the power handle;

c. the said wiring compartment including a printed circuit board having a DC-to-DC inverter circuit to step up the

low voltage DC from the batteries into high voltage DC to power the said flash unit;

d. the lower end of the flash unit having a battery compartment, and a dummy battery replacement module fitted into this battery compartment, the said dummy battery module having a cable connected back to the said wiring compartment of the power handle to pick up the low voltage DC from the power handle;

e. and a removable high voltage cable connected between the wiring compartment of the power handle and the flash unit for furnishing the high voltage DC from the power handle to the flash unit;



f. the said wiring compartment of the power handle being furnished with a cable of low voltage DC that is connected at its other end to a camera shutter release solenoid that is adapted to be fastened to the shutter release button of the camera;

g. and a shutter release switch mounted on the exterior of the said power handle so that when it is actuated the camera shutter is released and the flash unit is being simultaneously energized by the high voltage DC furnished from the DC-to-DC inverter circuit of the power handle.

4,592,636

VIEW FINDER OPTICAL SYSTEM

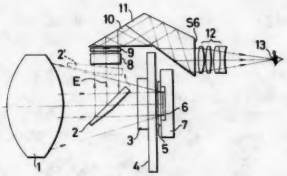
Masatake Kato, Tokyo; Tetsuharu Nishimura, and Hideo Yokota, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,292

Claims priority, application Japan, May 7, 1984, 59-90762; May 7, 1984, 59-90763; May 7, 1984, 59-90764; May 23, 1984, 59-75564[U]; May 23, 1984, 59-75565[U]; May 23, 1984, 59-75566[U]; Jun. 11, 1984, 59-119473; Jun. 18, 1984, 59-90478[U]

Int. Cl.⁴ G03B *13/02*

U.S. Cl. 354—225 **12 Claims**



1. A view finder optical system comprising:

optical path splitting means for dividing a second optical axis from a first optical axis of an objective optical system;

a predetermined image forming plane arranged on the second optical axis to form thereon an image which is obtained by said objective optical system;

a first prism arranged behind said predetermined image forming plane to bring about reflection an even number of times on said second optical axis, said second optical axis which comes out from the exit plane of said first prism being arranged to slant relative to an axis perpendicular to said exit plane;

a second prism which is disposed behind said first prism and is provided with a roof type reflection plane for effecting a first reflection and a reflection plane for further reflecting said second optical axis after said second optical axis is reflected by said roof type reflection plane; and

an eye-piece having an optical axis which coincides with said second optical axis coming out from said second prism,

a distance between said first optical axis and the optical axis of said eye-piece being arranged to be shorter than a distance between said first optical axis and said predetermined image forming plane.

4,592,637

FOCUS DETECTING DEVICE

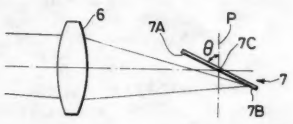
Shigeyuki Suda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 663,074

Claims priority, application Japan, Oct. 22, 1983, 58-163716[U]

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—403 **4 Claims**



1. A focus detecting device for detecting a focus state of an objective lens, comprising:

sensor means provided near a plane conjugate with respect to a predetermined imaging plane of the objective lens for sensing light from a light source reflected by an object; and

detection light receiving optical system for introducing the light through the objective lens to said sensor means;

said sensor means being inclined with respect to said conjugate plane, an optical axis of said detection light receiving optical system being offset from an optical axis of the objective lens,

said sensor means having a first and a second light-receiving area with said optical axis of said detection light-receiving optical system as the boundary, and said first and second light-receiving areas putting out electrical signals corresponding to the incident light independently of each other.

4,592,638

AUTOMATIC FOCUS ADJUSTING DEVICE

Naoya Kaneda, and Kazuya Matsuda, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,630

Claims priority, application Japan, Sep. 3, 1983, 58-162257; Sep. 3, 1983, 58-162258; Sep. 3, 1983, 58-162259; Oct. 22, 1983, 58-198007

Int. Cl.⁴ G03B *3/00;* H04N *5/38*

U.S. Cl. 354—403 **7 Claims**

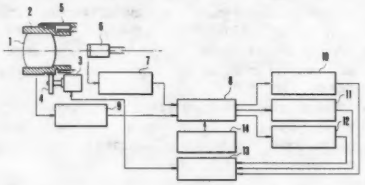
1. An automatic focus adjusting device comprising:

(a) a lens drive means for moving a focusing lens;

(b) lens position detecting means having a switch to be closed and opened in accordance with the position of said focusing lens and for producing a logic signal showing

whether said focusing lens is focused on a position shorter or longer than the determined distance in accordance with the closing and the opening of said switch;

(c) first range finding means, said means including light-emitting means for emitting range finding light to an object to be photographed, light receiving means for receiving said range finding light reflected from an object, and control means for moving said focusing lens to an in-focus position on the basis of the output signal of said light receiving means;



(d) second range finding means receptive of reflected natural light or indoor light from the object for producing an output signal based on the reflected light and for moving said focusing lens to an in-focus position;

(e) selecting means for selecting the operation of one of said first and said second range finding means on the basis of a signal from at least said lens position detecting means; and

(f) said selecting means having a gate means for receiving the logic signal from said lens position detecting means so as to select said first or said second range finding means in accordance with the position of said focusing lens.

4,592,639

ELECTRONIC FLASH UNITS

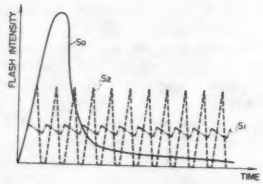
Hiroaki Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

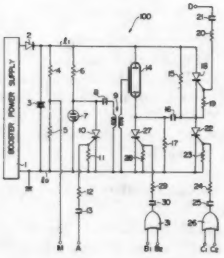
Filed Jan. 23, 1985, Ser. No. 694,111

Claims priority, application Japan, Apr. 24, 1984, 59-82335; Apr. 24, 1984, 59-82336; Apr. 24, 1984, 59-82337; Jul. 17, 1984, 59-148735

Int. Cl.[4] G03B *9/70*

U.S. Cl. 354—416 **36 Claims**





1. An electronic flash unit which is capable of obtaining flash characteristics substantially equivalent to a continuous flash by permitting a flash discharge tube to repeatedly emit a pulse flash during an exposure of camera shutter; comprising:

a series circuit combining said flash discharge tube and a main switching element which are interposed in a discharge loop of a main capacitor;

a trigger circuit for permitting said discharge tube to inititate flash emission in response to a synchronized signal from said camera;

a flash control circuit which produces a flash termination signal by detecting the fact that a value associated with pulse flashes reaches a predetermined level and further produces a flash resumption signal within a period of time less than the deionization time of said discharge tube after generation of said flash termination signal;

a flash termination circuit which forcibly turns said main switching element off in response to said flash termination signal to terminate said flash emissions; and

a flash resumption circuit which turns said main switching element on again in response to said flash resumption signal to resume said flash emissions of said discharge tube prior to the flash discharge tube de-ionization time.

4,592,640

STROBOSCOPIC LAMP SYNCHRONIZING DEVICE

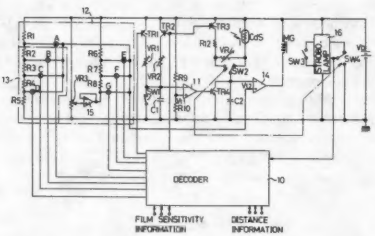
Kohichi Nishi, Yokohama, and Akira Takahashi, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 3, 1984, Ser. No. 677,184

Claims priority, application Japan, Dec. 1, 1983, 58-227402

Int. Cl.[4] G03B *7/087, 7/16, 15/05*

U.S. Cl. 354—422 **2 Claims**



1. A stroboscopic lamp synchronizing device for a photographic camera, comprising:

a first time setting circuit for providing a first time period starting from an actuation of a shutter release button of the camera;

a second time setting circuit connected operatively to said first time setting circuit for providing a second time period immediately following said first time period;

an electromagnet having a solenoid connected to said second time setting circuit, said electromagnet being energized upon said actuation of said shutter release button to start to open a shutter of the camera and deenergized upon a lapse of said second time period to start to close said shutter;

means connected to said second time setting circuit for varying said second time period in accordance with information supplied to said means indicating sensitivity of a film used and distance to an object to be photographed; and

an X contact for actuating stroboscopic illumination, said X contact being closed upon deenergization of said electromagnet, whereby said X contact is closed at a time at which said shutter is fully opened with an iris opening determined by said first period and said second time period, the latter being variable with said supplied information.

4,592,641
IMAGE TRANSFER DEVICE

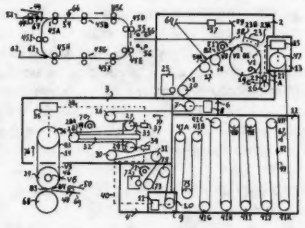
Johannes C. H. Roelofs, Gennep; Bastiaan B. B. Eertink, Grubbenvorst, and Petrus A. M. Geurts, Helden, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Mar. 29, 1985, Ser. No. 717,322

Claims priority, application Netherlands, Mar. 30, 1984, 8401011

Int. Cl.[4] G03G *15/16*

U.S. Cl. 355—3 TR **5 Claims**



1. A device for transferring image information present on a belt to an intermediate support, comprising a first drive means which propels the belt at a first speed, a second drive means which propels the intermediate support at a second speed; a pressing element for placing said belt in pressure contact with the intermediate support, whereby said belt assumes the speed of said intermediate support and transfers the image information from said belt to the intermediate support; a belt storage device disposed between the drive means and the pressing element for storing the length difference arising from the difference in the belt speed at the first drive means and at the pressing element, a measuring device to provide a measurement signal which is a measurement of the belt length present in the storage device and an adjusting means which adjusts the second speed in dependence on the length represented by the measurement signal.

4,592,642
DEVELOPING MATERIAL AMOUNT DETECTING APPARATUS

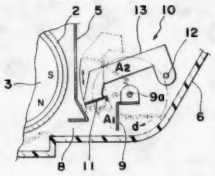
Masaru Imaizumi, Shinshiro, and Kenzou Tanaka, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1985, Ser. No. 726,770

Claims priority, application Japan, Apr. 28, 1984, 59-87600

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **9 Claims**



1. A developing material amount detecting apparatus for detecting an amount of developing material contained in a tank comprising:

a detection member provided inside said tank movably between a first position and a second position;

means for urging said detection member towards said first position;

means for periodically sending said detection member from said first position to said second position; and

means for detecting, while said sending means is actuating, the amount of said developing material inside said tank in accordance with a length of time in which said detection member is being held in said first position.

4,592,643
COPYING MACHINE HAVING REDUCED IMAGE MEMORY

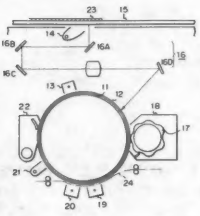
Teruaki Higashiguchi, Tokyo; Nobuhiro Miyakawa, Ashiya; Koji Yano; Kazuo Yamamoto, both of Tokyo, and Yoshinobu Kawakami, Tokyo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

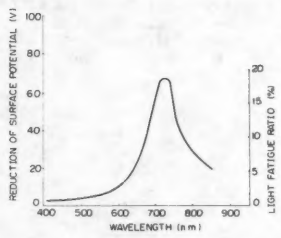
Filed Mar. 28, 1985, Ser. No. 716,996

Claims priority, application Japan, Mar. 28, 1984, 59-43382[U]; Mar. 28, 1984, 59-43383[U]; Mar. 28, 1984, 59-43384[U]; Mar. 28, 1984, 59-43385[U]; Mar. 28, 1984, 59-43386[U]

Int. Cl.[4] G03G *15/04*

U.S. Cl. 355—3 R **8 Claims**





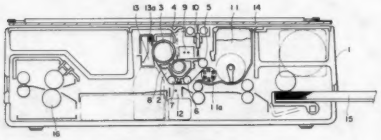
1. A copying machine having a photosensitive drum comprising an amorphous silicon type photoconductive layer formed on an electroconductive substrate and a light exposure mechanism in which an original placed on a transparent contact glass is irradiated with light and an image of the original is focussed on the photoconductive layer uniformly charged with a predetermined polarity through a predetermined optical system to form an electrostatic latent image, wherein the light for focussing the image of the original on the photoconductive layer is adjusted so as to have a wavelength shorter than 600 nm.

4,592,644

COPYING MACHINE USING A PHOTOSENSITIVE BELT

Yutaka Koizumi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Apr. 16, 1984, Ser. No. 600,466
Claims priority, application Japan, Apr. 15, 1983, 58-66804
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 BE 8 Claims



1. A copying machine comprising:

a housing;

a cassette which may be detachably mounted in position in said housing and which is provided with a take-up roller, a supply roller and a photosensitive web extending between said take-up roller and said supply roller, said web including a first section for forming a reproduced image thereon, a second section extending between said take-up roller and one end of said first section and a third section extending between said supply roller and an opposite end of said first section, whereby said web travels from said supply roller to said take-up roller during a copying operation and is rewound from said take-up roller to said supply roller to be set ready for the next cycle of copying operation;

means for rewinding said photosensitive web between each copying cycle; and

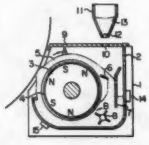
imaging means disposed in said housing for forming said reproduced image on said first section of said web.

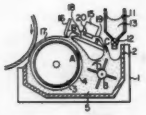
4,592,645

APPARATUS FOR CONTROLLING CONCENTRATION OF TONER IN DEVELOPER

Kenichi Kanai; Osamu Shimoe, and Sadaji Tashiro, all of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Japan

PCT No. PCT/JP83/00422, § 371 Date Jun. 14, 1984, § 102(e) Date Jun. 14, 1984, PCT Pub. No. WO84/02202, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 28, 1983, Ser. No. 624,688
Claims priority, application Japan, Nov. 29, 1982, 57-207524; Nov. 29, 1982, 57-207525; May 30, 1983, 58-95282
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—14 D 17 Claims





10. An apparatus for controlling toner concentration of a developer including a magnetic carrier and a color toner, comprising:

a container containing said developer;

means for dispensing the color toner into said container; and

detector means disposed at a predetermined position in said container and coupled to said dispensing means for allowing the color toner to be replenished into said container until an output from the detector indicates the toner concentration lies within a predetermined range, the detector means including:

a plurality of magnetic circuits each having magnetic gaps, the coupling coefficient of one of said magnetic circuits being set at a predetermined value equivalent to the coupling coefficient exhibited when the toner concentration lies within a predetermined range, and the coupling coefficient of the other of said magnetic circuits varying in proportion to the toner concentration;

coil members wound about each of said magnetic circuits for yielding a differential output from said magnetic circuits;

source means coupled to said magnetic circuits for providing a reference A.C. signal; and

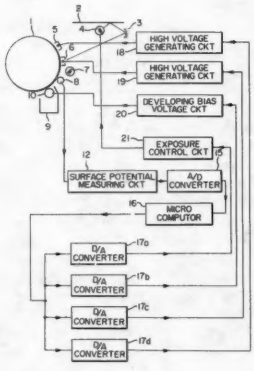
phase detector means for comparing the phases of the differential output and the reference A.C. signal and for yielding a D.C. voltage based on the phase comparison.

4,592,646

IMAGE FORMING APPARATUS WITH CONTROL FOR IMAGE FORMING CONDITIONS

Koji Suzuki, Yokohama; Jyoji Nagahira, and Kouki Kuroda, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 360,684, Mar. 22, 1982. This application Jan. 16, 1985, Ser. No. 692,048
Claims priority, application Japan, Mar. 27, 1981, 56-44069; Apr. 1, 1981, 56-47239; Apr. 1, 1981, 56-47240; Apr. 1, 1981, 56-47241
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 15 Claims



1. An image forming apparatus comprising:

image forming means for forming an image on a recording medium;

measuring means for measuring a sensitivity characteristic of the recording medium prior to the image formation; and

control means for detecting an image forming condition and controlling said image forming means to provide a proper image forming condition by means of performing a predetermined arithmetic processing for the detected value, said control means being adapted to determine a parameter involved in the arithmetical processing in accordance

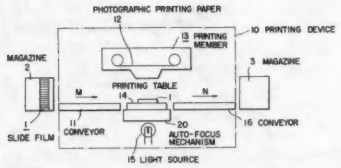
with the sensitivity characteristic measured by said measuring means.

4,592,647

AUTO-FOCUS SETTING METHOD AND APPARATUS FOR PRINTING SLIDE FILMS

Yasuhiro Seto, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1984, Ser. No. 618,406
Claims priority, application Japan, Jun. 15, 1983, 58-107451
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—40 **4 Claims**



1. An auto-focus setting method for printing a slide film in a printing system in which the slide film is shifted to a film printing position at which the slide film is focused on the focus position of a lens system by an auto-focus mechanism, comprising the steps of:

measuring auto-focus information before the slide film is introduced into the printing system;

operating the auto-focus mechanism in response to the measured auto-focus information; and

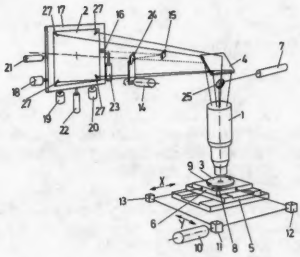
performing a printing operation of the slide film at a focus position of the slide film when the slide film reaches the printing position in the printing system.

4,592,648

DEVICE FOR PROJECTION COPYING OF MASKS ONTO A WORKPIECE

Werner Tabarelli, and Herbert E. Mayer, both of Fürstentum, Liechtenstein, assignors to Perkin-Elmer Censor Anstalt, Vaduz, Liechtenstein

Filed Jan. 23, 1985, Ser. No. 693,774
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—43 **5 Claims**



1. Device for projection copying of masks onto a workpiece, particularly onto a semiconductor substrate, for the manufacturing of integrated circuits, comprising:

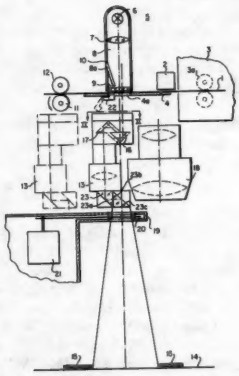
a projection lens through which patterns of the masks are passed for copying once or several times onto a light-sensitive layer of the workpiece, the mask and workpiece being oriented to each other in a relative way on opposite sides of said projection lens such that an orientation pattern of the mask and an adjusting mark of the workpiece are thereby brought into a predetermined spatial arrangement so that a relative position of a position-sensitive sensor as well as of the orientation pattern of the mask and at least one reference mark for the workpiece of a base table are determined before the adjusting mark is then copied onto the sensor, said workpiece being positioned on said base table, said projection lens also copying the adjusting mark of the workpiece onto the sensor with directly reflecting rays of light, which make visible the adjusting mark, being faded out, said position-sensitive sensor being installed on an underside of a frame carrying the mask, said underside being a side of said frame facing said projection lens.

4,592,649

PHOTOGRAPHIC ROLLER COPYING APPARATUS

Friedbert Freitag, Unterhaching; Friedrich Hujer, Petershausen; Erich Nagel, Anzing; Bernd Payrhammer, and Wolfgang Zahn, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,268
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412692; Apr. 4, 1984, 3412690
Int. Cl.[4] G03B *27/52, 27/70*
U.S. Cl. 355—43 **12 Claims**



1. A photographic roller copying apparatus for projecting film originals of various sizes on a tape-like copying material, the width of which corresponds to a desired format of a copy, and wherein originals are arranged in a film tape and have one dimension extended along said tape and another dimension extended transverse of said tape, the apparatus comprising two projecting systems; and means for illuminating an original, said projecting systems being interchangeably movable into a path of light in dependence on the format of the original being projected, one of said projecting systems including a pair of light path-displacing rotating porro-prisms for rotating an image to be projected by 90°, and means for obtaining a parallel displacement of the image which displaces the image back counter to the direction of the displacement obtained by the rotating porro-prisms for covering the light path without the use of the porro-prisms.

4,592,650

APPARATUS FOR PROJECTING A PATTERN ON A SEMICONDUCTOR SUBSTRATE

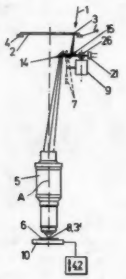
Werner Tabarelli, Vaduz, and Herbert E. Mayer, Eschen, both of Liechtenstein, assignors to Perkin-Elmer Censor Anstalt, Vaduz, Liechtenstein

Filed Jan. 23, 1985, Ser. No. 693,902

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1984, 3402177

Int. Cl.[4] G03B *27/42*

U.S. Cl. 355—53 **10 Claims**



1. In an apparatus for projecting a mask upon a semiconductive substrate to produce integrated circuits wherein a projection objective has an optical axis along which the substrate and the mask are disposed and, to determine the focus state, the sharpness of an image through the projection objective from the substrate on a detector plane is monitored, the improvement which comprises:

means for varying the optical path length without shifting of said substrate at least from a pattern on said substrate to a detector of rays passing from said pattern on said substrate through said objective to said detector by different increments; and

means connected to said detector for determining the path length corresponding to maximum sharpness of the image from said pattern on said substrate as a measure of said focus state.

4,592,651

COPIER WITH BOOKBINDING FUNCTION

Tomohiro Oikawa, Yokohama; Kenichi Shimizu, Kawasaki; Shigeru Suzuki, Yokohama; Izumi Tagoku, Tokyo; Masahiro Ishikawa, Hiratsuka, and Takashi Seto, Ayase, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,513

Claims priority, application Japan, May 10, 1984, 59-93713; May 28, 1984, 59-106609; May 28, 1984, 59-106610; May 28, 1984, 59-106611; May 31, 1984, 59-111600; May 31, 1984, 59-111603; Jun. 6, 1984, 59-115824; Jun. 6, 1984, 59-115825; Jun. 20, 1984, 59-126724; Jun. 21, 1984, 59-126452; Jun. 25, 1984, 59-130766

Int. Cl.[4] G03B *27/58;* G03G *15/00*

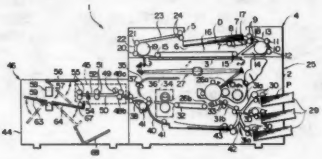
U.S. Cl. 355—72 **16 Claims**

1. A copier having a function of binding copy papers, comprising:

a copying device including an inverting mechanism for inverting the copy papers each carrying a copied image on the face thereof, and an intermediate tray for temporarily storing said copy papers to prepare for duplication on the other faces of the copy papers;

a recirculation type document handling device including a document tray for accommodating documents, and an inverting mechanism neighboring a glass platen of said copying device, said document handling device returning the documents fed out of said document tray back to the document tray after both faces, if necessary, of the documents have been illuminated by the copying device; and

a bookbinding device conjugate with a transport path along which the copy papers are discharged from the copying



device, said bookbinding device including a folding mechanism for creasing each of the copy papers at a central portion, and a binding mechanism conjugate with said folding mechanism.

4,592,652

SHEET MATERIAL CONTACTING DEVICE

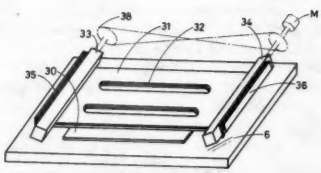
Kojiro Henmi, and Eiji Miyasaka, both of Hikone, Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Nov. 5, 1984, Ser. No. 668,349

Claims priority, application Japan, Jan. 31, 1984, 59-16758

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—76 **4 Claims**



1. A sheet material contacting device comprising:

a flexible sheet-like pressing member having a sufficient weight to force a sheet material against a planar transparent plate;

a pair of rigid support members fixedly holding opposed edges of said pressing member the support members being in the form of bars which are rotatable in mutually opposite directions; and

means for vertically moving said pressing member relative to said transparent plate.

4,592,653

DRY PROCESS DEVELOPING APPARATUS

Takashi Ikeda; Noboru Sawayama, both of Yokohama, and Hiroyuki Akamatsu, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,525

Claims priority, application Japan, Mar. 12, 1982, 57-39140; Mar. 24, 1982, 57-46525

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **21 Claims**

1. A dry process developing apparatus for processing an electrostatic latent image formed on a rotary photoconductive element into a toner image, comprising:

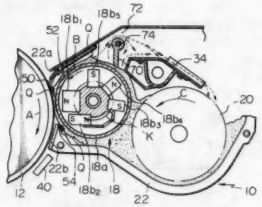
a housing formed with an opening which faces the photoconductive element;

a rotary magnet brush forming member positioned in the vicinity of said opening to form a magnet brush of a toner;

an upper seal member for sealing a gap between the upper end of the opening of the housing and the photoconductive element;

whereby leakage of the toner through said gap is prevented; and

a second seal member for sealing a gap between the lower end of the opening of the housing and the magnet brush forming member for thereby preventing the toner from leaking through the gap;



the second seal member being secured to the lower end of the opening of the housing at one end thereof and extending along the moving direction of the magnet brush forming member at the other end thereof into contact with the magnet brush formed on the magnet brush forming member.

4,592,654

HEAD-UP GUNSIGHT USING A SINGLE OPTICAL COMPONENT FOR VIEWING BOTH A RETICLE AND LANDSCAPE

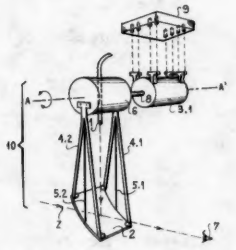
Hervé Girault, Bordeaux; Francois H. Gauthier, Boulogne-Billancourt, and Daniel Thomasson, Ambares, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 22, 1983, Ser. No. 534,832

Claims priority, application France, Sep. 24, 1982, 82 16160

Int. Cl.⁴ G02B *27/00, 23/00, 23/10*; F41B *1/00*

U.S. Cl. 356—247 **10 Claims**



1. A head-up sight comprising:

a luminous reticle generator;

a single optical component both for producing a collimated image of the reticle and for enabling said image to be viewed simultaneously with an external landscape;

mechanical means for fixing the single optical component relative to the reticle to constitute a movable assembly; and

drive means for rotating the assembly to move the reticle image and perform the aiming function.

4,592,655

METHOD OF DETERMINING ELEMENTS IN METALS BY MEANS OF OPTICAL EMISSION SPECTRUM ANALYSIS

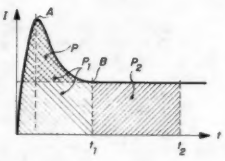
Karl Slickers, Echandens, Switzerland, assignor to A.R.L. Applied Research Laboratories, S.A., Ecublens, Switzerland

Filed Nov. 21, 1983, Ser. No. 553,830

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1982, 3244164

Int. Cl.⁴ G01N *21/67*

U.S. Cl. 356—313 **10 Claims**



1. A method of determining contents of elements in metals which are present as a total quantity in an elemental/dissolved form and in a non-elemental or separated form, which comprises sparking the surface of the metal under an inert atmosphere, and simultaneously measuring the spectral signal as a function of time, said signal which is obtained initially exhibiting an intensity peak, from which said non-elemental or separated element content is concluded, and said signal then stabilizing at a stationary value from which the total content (C_t) of said element is concluded, and said elemental/dissolved proportion (C_s) is concluded from the total area (P_1) below the peak, from the area (P_2) under the stationary intensity measured over a time (t_2-t_1) and from the total content (C_t).

4,592,656

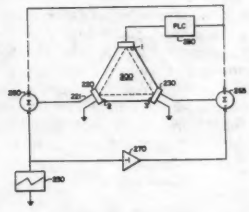
RING LASER ANGULAR RATE SENSOR WITH MODULATED SCATTERED WAVES

Werner H. Egli, Minneapolis, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jul. 5, 1983, Ser. No. 510,512

Int. Cl.⁴ G01C *19/64*

U.S. Cl. 356—350 **15 Claims**



1. A ring laser angular rate sensor comprising:

means for producing two counterpropagating waves traveling in opposite directions about an optical closed-loop path defined by a plurality of mirrors; and

first means for alternately advancing and retarding, at substantially a constant rate, the phase of backscattered waves reflected from a first one of said plurality of mirrors an integer number of 2π radians.

4,592,657

MIXING HEAD FOR PRODUCING A PREFERABLY CHEMICALLY REACTIVE MIXTURE OF TWO OR MORE PLASTICS COMPONENTS

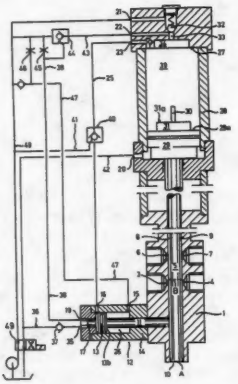
Peter Taubenmann, Munich, Fed. Rep. of Germany, assignor to Elastogran Maschinenbau GmbH, Strasslach, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,755

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331731

Int. Cl.[4] B01F *5/04*

U.S. Cl. 366—134 **5 Claims**



1. A mixing head for producing a preferably chemically reactive mixture of two or more plastic components, comprising a mixing chamber which has inlet orifices for the individual plastic components and an outlet orifice for the plastic component mixture, an expulsion plunger located in the mixing chamber and having the same cross-section as the mixing chamber, the expulsion plunger being connected with a working piston which is guided in a working cylinder which has a pressure chamber and can be actuated by a pressure medium, and being movable to and fro between a mixing position which leaves the inlet orifices open, and an expulsion position in which it seals the inlet orifices from the mixing chamber, as well as a restrictor which can be moved into and out of the mixing chamber by a pressure medium, wherein the working piston, in the direction of motion of the expulsion plunger for reaching the mixing position, displaces, starting shortly before and ending upon reaching the mixing position, a pressure medium from the pressure chamber within the working cylinder which has a control surface which faces away from the expulsion plunger, whereby the piston which pushes the restrictor into the mixing chamber can be moved, and wherein for the motion of the expulsion plunger for reaching the expulsion position, the working piston can be subjected with a pressure medium via two connections, of which one connection can be sealed shortly after the working piston leaves its mixing position, and at the same time the restrictor can be pushed out of the mixing chamber, while thereafter the other connection can be subjected to a pressure medium.

4,592,658

MATERIAL ENTRAINMENT AND CIRCULATION IMPELLER AND METHOD FOR SUBMERGING AND ENTRAINING MATERIAL IN A MEDIA

Raymond J. Claxton, 7123 Lyre La., Dallas, Tex. 75212

Filed Sep. 25, 1984, Ser. No. 653,902

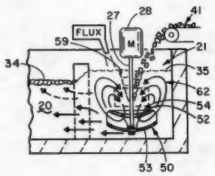
Int. Cl.[4] B01F *5/12*

U.S. Cl. 366—265 **52 Claims**

1. An improved media circulator and stabilized media vortex generator for submerged use in a system for submerging and entraining a charge in a media wherein said change comprises pieces not readily capable of self-submergence, said circulator and stabilized media vortex generator comprising:

a rotatably driven vertical shaft secured to a horizontally disposed lower member which is provided with mechanical vane means to couple said lower member to a spaced apart horizontally disposed upper member which has a central opening through which said vertical shaft passes and said media enters,

said upper and lower members having curved portions that are positioned in a nested mating relationship such that



said media is drawn vertically down into said central opening of said upper member and then redirected upwards at an angle from the horizontal because of said curved portions and radially accelerated between said vane means and said upper and lower members to thereby establish in said media circulating force while simultaneously establishing a stabilized vortex in said media to thereby provide a media circulator and stabilized media vortex generator that allows simultaneously increasing charge entrainment rates in said stabilized vortex in the presence of increased vertical shaft rotation rates and increasing media depth above said upper member.

4,592,659

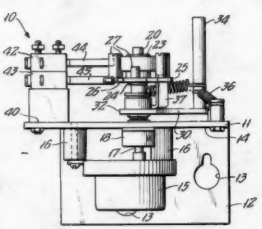
TIMER FOR COIN OPERATED DEVICES

Leonard Mercurio, Dix Hills, N.Y., assignor to Set-O-Matic, Inc., Burnside, N.Y.

Filed Mar. 18, 1985, Ser. No. 713,256

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—1 **1 Claim**



1. In an improved timing device for use with a coin-operated appliance, including a timing motor driving a gear train, the improvement comprising: a first motor output shaft, resilient slip clutch means engaging said output shaft, a ratchet wheel driven by said slip clutch means said wheel including a plurality of ratchet teeth and a corresponding number of pins extending laterally therefrom; first and second switches, said first switch controling said motor, said second switch controling operation of an associated appliance; each of said switches having an operating lever, one of said levers being moved by contact with the periphery of said ratchet wheel, the other said switches being moved by contact with corresponding pins; an orbitally mounted pawl surrounding said slip clutch means,

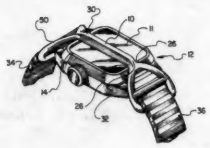
said ratchet wheels being advanced to starting position by movement of said pawl in response to movement of a coin slide.

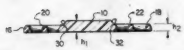
4,592,660

WATCH PROTECTOR

James Hartman, 22732 Berdon St., Woodland Hills, Calif. 91367, and Blake Schwartzman, 6548 Sausalito Ave., Canoga Park, Calif. 91307

Filed Nov. 9, 1984, Ser. No. 670,473
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—286 3 Claims





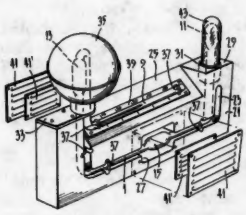
1. A watch protector comprising a resilient guard member for e.. ..nding across the face of the watch and two flexible ring members, each ring member being attached at an end of the guard member and having a cross-piece extending between opposite sides of the ring member for dividing the ring member into two openings, one closer to the guard member and the other more distant from the guard member, at least one of the openings or each ring member receiving portions of a watch band extending from opposite sides of the watch, the guard member extending as a single member across the center of the watch, the guard member having a vertical dimension extending upward from the face of the watch greater than the vertical dimension of the ring members when the ring members are aligned with the guard member.

4,592,661

HEAT STRESS MONITOR

Bruce L. Wilson, Cheltenham, Australia, assignor to Dobbie Instruments (Australia) Pty. Ltd., West Perth, Australia

Filed Nov. 16, 1984, Ser. No. 672,193
Claims priority, application Australia, Nov. 18, 1983, PG2454
Int. Cl.[4] G01N *25/00*; G01K *3/00*
U.S. Cl. 374—10 11 Claims



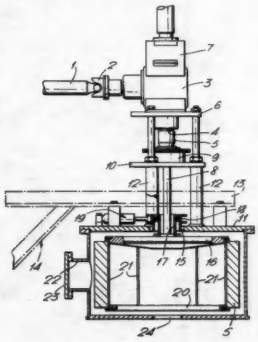
1. A heat stress monitor comprising a thermometer tube shaped generally in a shallow U configuration and having a black globe-bulb on one free arm thereof and a wet-bulb on the other free arm thereof, there being an interconnection across the base of the U between the bulbs so as to connect said bulbs in series, a black globe for receiving the black globe-bulb and means capable of moistening the surface of the wet-bulb, the thermometer tube being adapted to provide a direct reading of wet-bulb globe temperature, and a common thermally responsive medium in the tube which medium extends from the wet-bulb through the tube into the black globe-bulb and beyond said black globe-bulb into an extension part of the tube which extends substantially parallel with the base of the U and is provided to permit a reading to be taken of the position of the thermally responsive medium, the internal volumes of the black globe-bulb and the wet-bulb being respectively proportional to the percentages of the black globe temperature and of the wet-bulb temperature required for determining the wet-bulb globe temperature whereby the position of the thermally responsive medium is indicative of the wet-bulb globe temperature.

4,592,662

THERMAL TEST FOR INVESTIGATING FRACTURE MECHANICS OF PRESSURE VESSEL STEELS BY APPLYING THERMAL SHOCK AT HIGH ROTATIONAL SPEEDS

Eric J. Robbins; Alan M. Clayton, both of Warrington; William P. White, South Wirral, and Robert E. Leckenby, Warrington, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 16, 1984, Ser. No. 600,787
Claims priority, application United Kingdom, Apr. 26, 1983, 8311382
Int. Cl.[4] G01N *25/72*
U.S. Cl. 374—57 11 Claims



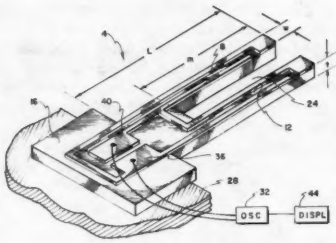
1. Equipment for investigating crack propagation in thick plates of a steel material of predetermined thickness under investigation for pressure vessel applications, comprising a test specimen in the form of a hollow cylinder of the material, the wall thickness of the cylinder being equivalent to the predetermined thickness of the plates, a vertical spindle for rotation at a speed of the order of thousands of revolutions per minute and from which said hollow cylinder is suspended so as in operation to induce substantial hoop stresses in the cylinder, damping means for damping against flexural resonance vibrations of said cylinder and spindle, means for heating the rotating cylinder to a temperature approximating to the expected operating temperature of the pressure vessel, and means for applying a desired amount of thermal shock to the rotating cylinder.

4,592,663

RESONATOR TEMPERATURE TRANSDUCER

Errol P. EerNisse, Sandy, and Robert B. Wiggins, West Valley City, both of Utah, assignors to Quartex, Inc., Salt Lake City, Utah

Filed May 10, 1984, Ser. No. 608,857
Int. Cl.[4] G01K *11/22*
U.S. Cl. 374—117 **14 Claims**



1. A resonator temperature transducer comprising

a pair of elongate, spaced-apart, generally parallel bars coupled together at one end, said bars each having a thickness t and width w, with the distance from the location at which the bars are coupled together to the free ends of the bars being m, and said bars being made of a material so that when the bars are caused to vibrate in the torsional mode, the frequency of vibration varies as a function of temperature,

an enlarged mounting section formed integral with the bars at said one end, with the distance from the mounting section to the free ends of the bar being L,

means for causing said bars to vibrate in the torsional mode 180° out of phase at a frequency f_T, and

wherein t, w, m and L are selected so that

$$\frac{f_T}{f_{an}} = \frac{Z\frac{t}{w}\frac{m}{w}}{A_{an}\,CDK} \neq 1$$

$$\frac{f_T}{f_{pn}} = \frac{Z\frac{L^2}{m^2}\frac{m}{w}}{A_{pn}\,CDK} \neq 1$$

$$\frac{f_T}{f_{bn}} = \frac{Z\frac{t}{w}\frac{L^2}{m^2}\frac{m}{w}\sqrt{1+\frac{1}{L/m}}}{A_{bn}\,CDK} \neq 1$$

$$\frac{f_T}{f_{wn}} = \frac{Z\frac{m}{w}\sqrt{1+\frac{L}{m}}}{A_{wn}\,CDK} \neq 1$$

where

A_{an}=3.05, 18.99, 51.92 for n=1, 2 and 3

A_{bn}=8.57, 41.82, 96.97 for n=1, 2 and 3

A_{pn}=3.91, 22.12, 59.09, 114.1, 189.9, 281.8 for n=1, 2, 3, 4, 5 and 6

A_{wn}=4.96, 30.91, 71.82, 89.80, 143.4, 180.8 for n=1, 2, 3, 4, 5 and 6

$$C = \sqrt{1 + t^2/w^2}$$

$$D = \sqrt{1 + \frac{S_{55}}{S_{66}} \cdot \frac{t^2}{w^2}}$$

-continued

$$K = \frac{1}{2\pi}\sqrt{E/12P}$$

$$G = 0.45$$

$$Z = G\sqrt{1/S_{66} \cdot P}$$

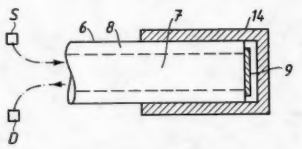
f_{an}, f_{pn}, f_{bn} and f_{wn} are the frequencies of vibration of spurious modes of the transducer, where n is the order of the mode, P is the density of the material and S_{55} and S_{66} are shear compliances and E is Young's Modulus of the material.

4,592,664

LUMINESCENT SENSOR FOR AN OPTICAL TEMPERATURE-MEASURING DEVICE

Bo Bijlenga; Bertil Hök, and Maria Nilsson, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 10, 1984, Ser. No. 598,817
Claims priority, application Sweden, Apr. 12, 1983, 8302020
Int. Cl.[4] G01J *5/10*; G01K *1/02*
U.S. Cl. 374—131 **8 Claims**



1. In a fiber-optic temperature-measuring device which comprises means providing energizing radiation, a luminescent temperature-measuring transducer means, a detector means to receive radiation from the transducer means and at least one optical fiber means optically linking the means providing the energizing radiation, the transducer means and the detector means, the improvement wherein the transducer means comprises a crystalline sensor material which contains luminescent neodymium ions, at least some of these luminescent ions being so located in the crystal lattice of the sensor material that for each of said at least some luminescent ions each immediately adjacent anion substantially shows inversion symmetry in relation to that luminescent ion said crystalline sensor material being selected from the group consisting of $Aa_2AbNd_xR_{1-x}Ha_6$, $Aa_5Nd_xR_{1-x}Ab_2Ha_{10}$, $Nd_2Sn_2O_7$ and $Ba(R_{0.5-x}Nd_xTa_{0.5})O_3$, where Aa and Ab are alkali metals, Nd is neodymium, R is an optically inactive rare earth metal, Ha is a halogen, Sn is tin, O is oxygen, Ba is barium, Ta is tantalum, and x designates the concentration of neodymium given as a mole fraction and is greater than zero and less than or equal to one.

4,592,665

TEMPERATURE-CONTROLLED SYSTEMS FOR NON-THERMAL PARAMETER MEASUREMENTS

Desmond Wheable, Basingstoke, Great Britain, assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed May 14, 1984, Ser. No. 610,138
Claims priority, application United Kingdom, May 27, 1983, 8314846
Int. Cl.[4] G01K *1/08*
U.S. Cl. 374—143 **23 Claims**

1. In a method of measuring a non-thermal physical parameter with temperature-sensitive means arranged in a bridge circuit including input terminals, the improvement comprising in combination the steps of:

providing a constant voltage;

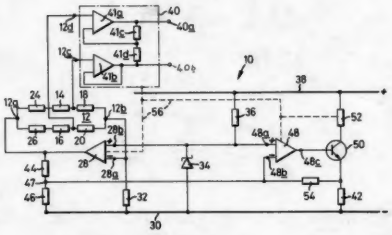
deriving a constant current from said constant voltage;

applying said constant current to said input terminals of the bridge circuit;

imparting a predetermined temperature to said temperature-sensitive means;

measuring said physical parameter with said temperature-sensitive means;

subjecting said temperature-sensitive means to temperature variation affecting said predetermined temperature;



employing said temperature-sensitive means themselves and a resistive circuit connected thereto for effecting a measurement of said temperature variation by sensing a change in potential difference across said input terminals due to said temperature variation and providing a signal in response to said change in potential relative to said constant voltage; and

continuously restoring said temperature-sensitive means to said predetermined temperature in response to said signal relative to said constant voltage.

4,592,666

SEALING DEVICE FOR SEALING A BEARING

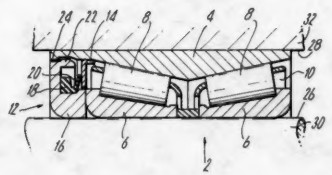
Lennart Jörnhagen, Högabergsgatan, Sweden, assignor to Forsheda AB, Forsheda, Sweden

Continuation of Ser. No. 496,365, May 20, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 771,476

Claims priority, application Sweden, Jun. 3, 1982, 8203421

Int. Cl.[4] F16C *33/78*

U.S. Cl. 384—477 **2 Claims**



1. A bearing arrangement comprising:

first and second opposed substantially cylindrical concentric surfaces of two machine elements which form an annular zone and are rotatable with respect to each other;

a bearing positioned in said annular zone, said bearing comprising first and second rings connected firmly to said first and second cylindrical surfaces respectively; and

means for sealing said bearing both when said bearing is unassembled alternatively when assembled with said machine elements said means comprising a sealing device positioned in said annular zone at an outer end thereof, said sealing device comprising an axially movable annular element consisting of a substantially rigid material in firm contact with said first of said substantially cylindrical surfaces and extending radially therefrom to form a clearance space in relation to a portion of the bearing which is connected firmly to the second of the substantially cylindrical surfaces, said annular element and said portion 4 of the bearing connected firmly with the second of the substantially cylindrical surfaces being provided with engagement surfaces which are movable to and from firm engagement with each other by axially moving the annular element, and said portion of the bearing in relation to each other.

4,592,667

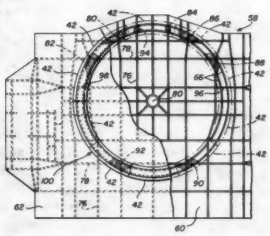
METHOD AND APPARATUS FOR MINIMIZING EFFECT OF HARD SPOTS IN ROTATING FRAME STRUCTURE OF MINING MACHINE ON ROLLER BEARINGS

Dev R. Malik, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 12, 1985, Ser. No. 796,932

Int. Cl.[4] F16C *19/30, 27/08*

U.S. Cl. 384—593 **16 Claims**



1. In apparatus for minimizing the effect of hard spots on bearing rollers in a mining machine frame having a steel base, including upper and lower plates, supporting a steel rotating frame, including upper and lower plates, on a bearing roller circle, said bearing roller circle comprising an upper segmented bearing rail attached to the underside of the lower plate of said rotating frame, a lower segmented bearing rail attached to the top surface of the upper plate of said base, a bearing assembly positioned between said upper and lower bearing rails for carrying said rotating frame, at least one annular steel bulkhead for strength rigidly attached to the top side of the lower plate of said rotating frame and congruent with said upper bearing rail, a plurality of second steel strengthening longitudinal and transverse bulkheads intersecting said at least one annular bulkhead, at least some of said intersections causing hard spots having deleterious effects on said bearing rollers, at least one additional annular steel strengthening bulkhead rigidly attached to the underside of the plate of said base and congruent with said lower rail assembly and a plurality of third steel strengthening longitudinal and transverse bulkheads intersecting said at least one additional annular bulk head, at least some of said intersections causing hard spots having deleterious effects on said bearing rollers, the improvement comprising:

a. a bearing rail segment positioned over each location of said intersecting bulkheads causing said hard spot, and

b. a plate of metal softer than said steel positioned between at least some of said bearing rail segments and said bulkhead intersections whereby the deleterious effects of said hard spots on a bearing caused by said bulkhead intersections are minimized by an overall reduction of stiffness caused by said material.

4,592,668

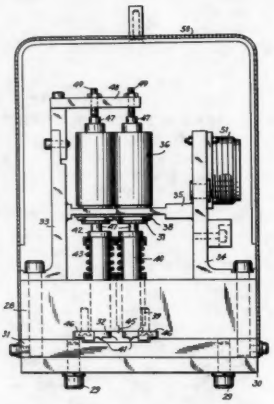
METHOD FOR STAMPING INDICIA ON MATERIALS

Edward F. Kubacki, Marengo; Edward C. Jacobs, Wauconda; John M. Masciale, and James R. Monroe, both of Palatine, all of Ill., assignors to American Can Co., Greenwich, Conn.

Division of Ser. No. 430,761, Sep. 30, 1982, Pat. No. 4,476,781. This application Jul. 20, 1984, Ser. No. 616,238

Int. Cl.[4] B41F *17/00*

U.S. Cl. 400—127 3 Claims



1. A method for stamping indicia on thin sheet material comprising feeding said material into spaced alignment with a die, applying energy to said die to rapidly impart a determined kinetic energy thereto to direct it at high velocity toward said material by energizing a solenoid having an armature positioned to impart energy to said die, said step of energizing comprising energizing said solenoid with a duty cycle of less than 2 percent and a high power dissipation from 10 to 20 times the continuous rating thereof, said high power dissipation rapidly imparting said high velocity to said die, guiding said die to impact said material to dissipate substantially all of the kinetic energy imparted thereto in said step of applying in the deformation of said material while maintaining the relative alignment of said material and die, and resiliently retracting said die from said material after said impact.

4,592,669

DIRECT-RECORDING PRINTER AND HOUSING STRUCTURE THEREFOR

Gerhard Lohse, Erlangen; Johann Ramold, Buckenhof, and Gerhard Klee, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 692,970

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402067

Int. Cl.[4] B41J *29/02, 11/66*

U.S. Cl. 400—621 18 Claims

1. A direct-recording printer comprising a printhead; a platen rotatably mounted on an axle and arranged proximate to said printhead for advancing a paper web past said printhead and for providing a counter pressure to said printhead; a paper-cutting bar including a cutting edge for cutting the paper web once it has passed said printhead; a paper storage compartment for holding a paper supply, said platen being accessible through said paper storage compartment for insertion of paper; a cover plate for said paper storage compartment mounted for movement between opened and closed positions, said cover plate having an L-shaped cross-section and having a first and second section angled with respect to each other; said cutting edge of said cutting bar being mounted exterior of a region defined by the closest distance between said platen axle and said paper cutting bar, said paper cutting bar including said cutting edge extending over said platen, said first section of said cover plate when in the closed position overlapping and extending beneath a predetermined portion of said paper cutting bar; first motion means for initially moving said cover

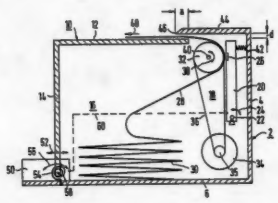


plate linearly to clear said paper cutting bar when moving said cover plate to the open position; said first motion means being operatively connected to said cover plate, said second section thereby serving as an operation element for initiation of said linear motion; and second motion means for rotating said cover plate about an axis parallel to said platen axle after said cover plate has cleared said cutting bar.

4,592,670

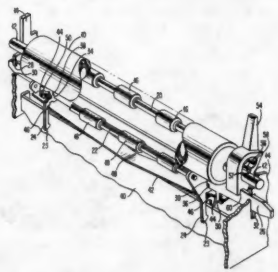
ANGULAR MOTION PAPER FEED RELEASE SYSTEM

Edgar H. Frank, and Steven R. Komplin, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,362

Int. Cl.[4] B41J *13/048*

U.S. Cl. 400—637.6 11 Claims



1. A paper feed for a printer, comprising:

a platen having a platen shaft and a axis of rotation;

support frame members spaced apart for supporting said platen;

said support frame members defining slots therein below said platen shaft;

a member extending through said slots and parallel to said platen axis;

one of said slots in said support frame defining a pivot for said member;

support means for supporting feed rolls, said support means supported on said member;

said feed rolls engageable with said platen;

release means comprising a lever and cam surface, said cam surface acting against said platen shaft, for moving said member from a first position in the other of said slots to a position displaced from said first position and said platen

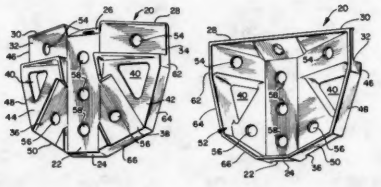
while pivoting said member in said one of said slots to relieve engagement of said feed rolls with said platen.

4,592,671

CONNECTOR PLATE FOR FABRICATING BUILDINGS

William K. Daum, P.O. Box 5, Cambridge, Wis. 53523

Filed Jun. 21, 1984, Ser. No. 623,020
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—171 **14 Claims**



1. A connector plate for securing a plurality of struts into a building structure of varied configuration, comprising; a main rigid body of unitary design having a plurality of strut receiving connections formed therein;

said connector plate having an outer surface opposed to an inner surface with said connections being formed on said outer surface;

a longitudinally extending connection located along a plane of symmetry which terminates in a short roof connection arranged to form an obtuse angle therebetween;

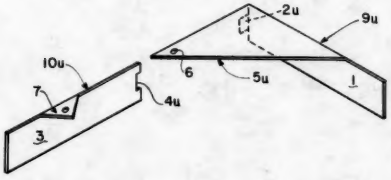
opposed connections arranged on opposed sides of and perpendicular to said longitudinally extending connection with the opposed connections with said lower connections forming an inclined angle of 60° therebetween.

4,592,672

STRUCTURAL JOINT APPARATUS

Asher G. Ruch, Jr., 7648 Harshmanville Rd., Huber Heights, Ohio 45424

Filed Mar. 7, 1984, Ser. No. 587,212
Int. Cl.[4] F16B *9/02*
U.S. Cl. 403—205 **19 Claims**



1. An assembly capable of being assembled into a substantially rigid joint, comprising:

(a) separate first and second substantially rigid legs capable of being placed in an erected condition with respect to one another, said legs having respective portions which together form a corner when said legs are placed in said erected condition;

(b) interengagable means defined on said respective corner-forming portions of said legs at locations adjacent to said corner formed by said portions and capable of being disposed in a releasable mated relationship when said legs are placed in said erected condition;

(c) a substantially rigid bracing member internally connected to and extending outwardly from one of said legs, said bracing member extending toward and along the other of said legs so as to form a reinforcing bridge spanning said corner formed by said corner-forming portions of said legs when the latter are placed in said erected condition; and

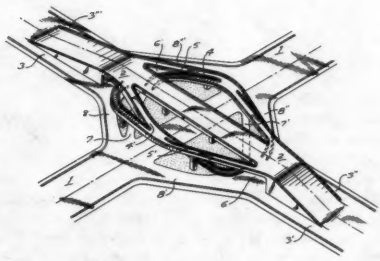
(d) interconnectable means defined on said bracing member and said other of said legs at locations displaced remote from said corner-forming portions of said legs and displaced remote from said corner when said legs are placed in said erected condition, said interconnectable means capable of being fastened together for retaining said legs in said erected condition and said interengagable means in said mated relationship to thereby provide a substantially rigid joint.

4,592,673

DOUBLE-FRAMED "H" FORM NON-STOP ROADWAY INTERCHANGE

Soo-Yang Lee, No. 1307, Bldg. 16 Jangmi Apt. House, Jamsil 4-dong, Gangdong-Ku, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 461,038, Jan. 26, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,263
Claims priority, application Rep. of Korea, Jan. 27, 1982, 595/82
Int. Cl.[4] E01C *1/04*
U.S. Cl. 404—1 **6 Claims**



1. A roadway interchange for connecting first and second roadways, comprising (a) a level elevated road section overlying said first roadway, (b) first and second graded road sections connecting said level elevated road section with respective non-elevated portions of said second roadway disposed on either side of said first roadway, (c) first through fourth level curved ramp sections overlying said first roadway, said first and second level curved ramp sections being arranged adjacent to each other on one side of said second roadway, said third and fourth level curved ramp sections being arranged adjacent to each other on the other side of said second roadway, (d) first through fourth level straight ramp sections, said first and third level straight ramp sections being arranged on one side of said first roadway and connecting said first and third level curved ramp sections respectively with said level elevated road section, and said second and fourth level straight ramp sections being arranged on the other side of said first roadway and connecting said second and fourth level curved ramp sections respectively with said level elevated road section, (e) first through fourth graded curved ramp sections, each of said graded curved ramp sections partly underlying said level elevated road section, and (f) first through fourth graded straight ramp sections, said second and fourth graded straight ramp sections being arranged on said one side of said first roadway and connecting said second and fourth level curved ramp sections respectively to said second and fourth graded curved ramp sections respectively, and said first and third graded straight ramp sections being arranged on said other side of said first roadway and connecting said first and third level curved ramp sections respectively to said first and third graded curved ramp sections respectively, wherein the vertical projections of said first level straight ramp section and said second graded straight ramp section are substantially parallel, the vertical projections of said first graded straight ramp section and said

second level straight ramp section are substantially parallel, the vertical projections of said third level straight ramp section and said fourth graded straight ramp section are substantially parallel, and the vertical projections of said fourth level straight ramp section and said third graded straight ramp section are substantially parallel.

4,592,674

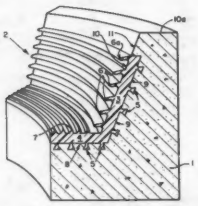
CONCRETE MANHOLE

Michael G. Baliva, 161 Sunset St., Rochester, N.Y. 14606

Filed Mar. 23, 1978, Ser. No. 889,195

Int. Cl.[4] E02D *29/11*

U.S. Cl. 404—25 **9 Claims**



1. A manhole structure having two barrels, one thereof having a male end, and the other thereof having a female end; said male end having an external peripheral surface, said female end having an internal peripheral surface, and said female end having said male end therein;

said barrels being positioned vertically, one on top and one on the bottom, and there being support means for causing the weight of the top barrel to be supported by the bottom barrel, while maintaining an annular space between said surfaces;

said space having an annular gasket therein, said gasket having resilient sealing flange means extending around said space and in sealing contact with one said peripheral surface, and said gasket having anchor means extending around said space, and being embedded in the said end having the other said peripheral surface; and

said gasket having an annular seat flange extending thereabout, said seat flange extending away from said space and horizontally between said barrels, and each said barrel having an annular surface sealingly contacting said seat flange.

4,592,675

REVETMENT PANEL WITH STAGGERED COMPARTMENTS

John M. Scales, Norcross, and Bernard F. Wolcott, Roswell, both of Ga., assignors to Nicolon Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 424,563, Sep. 27, 1982, Pat. No. 4,449,847. This application Mar. 14, 1984, Ser. No. 589,485

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.[4] E02B *3/12*

U.S. Cl. 405—19 **19 Claims**

1. A web comprising:

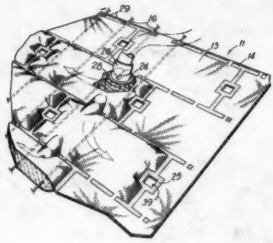
(a) an upper and a lower fabric layer;

(b) compartments which are staggered in relation to one another, having walls formed by the fabric layers;

(c) selvage separating the compartments, formed by fastening together the fabric layers;

(d) a plurality of cable slots formed in the selvage, each communicating with at least one of the compartments;

(e) a plurality of longitudinal cables, each passing through at least one cable slot and interconnecting at least two compartments; and



(f) a plurality of filling slots formed in the selvage, each communicating with at least one of the compartments.

4,592,676

ARRANGEMENT FOR DAMMING WATER AND ALSO FOR DRAINING AWAY THE VOLUME OF WATER ABOVE A CERTAIN LEVEL IN A VEGETATION-BEARING STRATUM

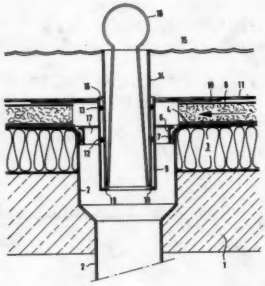
Hans Gilgen, Neuwilerstrasse 60, CH-4104 Oberwil, Switzerland

Filed Jun. 7, 1984, Ser. No. 617,965

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321096

Int. Cl.[4] E04D *13/04*

U.S. Cl. 405—36 **4 Claims**

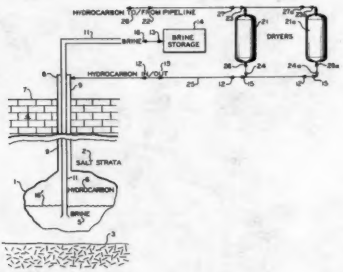


1. An arrangement for damming water and also for draining away the volume of water above a certain level in a vegetation-bearing stratum which is disposed on a base covered by a sealing layer, having a root protection sheet arranged between the vegetation-bearing stratum and the sealing layer, having an inlet channel provided in the base and which is open at the top having a drainage hole in both the sealing sheet and the root protection sheet, which holes are positioned above the inlet channel opening, having a pipe socket set into the inlet channel and provided externally with a plate-like flange next to its upper edge, and having a water-damming pipe arranged in the pipe socket at an adjustable height, its exterior being sealed against the interior of the pipe socket, characterized in that the pipe socket is arranged with clearance in the inlet channel, and that the plate-like flange of the pipe socket is joined so as to be sealed in respect of the roots to the edge region of the root protection sheet surrounding the drainage hole in the root protection sheet.

4,592,677
DESICCANT BED ON HYDROCARBON CHARGED TO AND REMOVED FROM UNDERGROUND (SALT) CAVERN

Stone P. Washer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 21, 1984, Ser. No. 591,754
Int. Cl.[4] B65G *65/30*
U.S. Cl. 405—59 **15 Claims**



1. A hydrocarbon fluid storage system comprising in operable conjunction:

a cavern formed within an underground salt strata below a ground surface, said cavern comprises a lower liquid volume of saturated sodium chloride storage brine and an upper fluid volume of wet hydrocarbon storage fluid,

surface fluid handling means;

conduit connecting said lower storage brine and upper storage hydrocarbon fluid with said surface fluid handling means, of fluid transfer means enabling transfer of brine and hydrocarbon fluid from said surface to said cavern and from said cavern to said surface, such that brine can be added to or withdrawn from said lower brine volume and hydrocarbon fluids can be added to or withdrawn from said upper hydrocarbon fluid volume, and

at least one desiccant drier means positioned at the surface in operable association with said surface fluid handling means whereby said wet hydrocarbon fluid upon withdrawal from said cavern passes through said desiccant drier means and thereby becomes dry, and dry hydrocarbon fluid intended for storage passes through said desiccant drier prior to entering said storage cavern and thereby becomes wet.

4,592,678
MODULAR BLOCK RETAINING WALL

Edwin K. McNinch, Jr., 5225 Wooster Ave., San Mateo, Calif. 94403, and James E. McNinch, 1404 Floribunda Ave., Burlingame, Calif. 94010

Filed May 14, 1984, Ser. No. 609,768
Int. Cl.[4] E02D *29/02*
U.S. Cl. 405—284 **3 Claims**

1. A retaining wall comprising

an ordered array of modular blocks each having a horizontal cross-section defining a double "T" shape the top of said "T" defining a vertical planar member having the stem of each "T" defining a generally planar leg member having a height equal to the height of said vertical planar member,

said leg members each disposed from opposite ends of said vertical planar member a distance of one-quarter of the length of said vertical planar member,

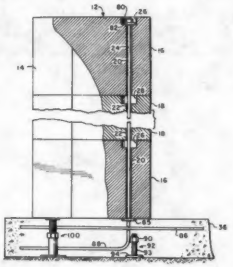
each of said legs comprising means defining a hole proximate the end of said leg distal said vertical planar member and having a longitudinal axis disposed vertically through said leg,

said double "T" shaped block vertically arranged in staggered courses with said holes in said legs vertically aligned with the holes in the legs of the course above, and the ends of said vertical planar members abutting each other, and

means adapted to be received in said holes for connecting said modular blocks together said means comprising

a reinforcing member comprising

a generally straight vertical tension arm adapted to be received in said hole in said said leg member of said modular block and projecting vertically through said modular blocks,



a generally straight horizontal base reinforcing arm disposed at right angles to said generally straight tension member and projecting horizontally under said wall in a direction generally perpendicular to said wall,

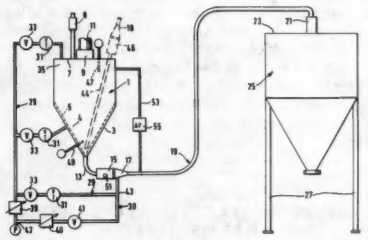
a bracket attached to said vertically disposed tension arm for supporting said modular blocks,

means connected to said vertical tension arm for adjusting the elevation of said base reinforcing arm above a supporting surface prior to pouring a concrete footing under said modular blocks.

4,592,679
PNEUMATIC CONVEYING PROCESS AND APPARATUS

Hans H. Boiting, Steinfurt; Bernd Federhen, Siegen, and Gerhard Müller-Späth, Freudenberg, all of Fed. Rep. of Germany, assignors to Alb. Klein GmbH & Co. KG, Niederfischbach, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,588
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208616
Int. Cl.[4] B65G *53/46*
U.S. Cl. 406—127 **2 Claims**



1. A process for pneumatically conveying loose material by discharge thereof from a conveyor container containing same through a conveyor conduit connected thereto, including the steps of: emptying the conveyor container; closing the conveyor conduit at its inlet and outlet ends after the conveyor container becomes empty and before the conveyor conduit is emptied by material being conveyed thereby to maintain the conduit substantially in its condition existing at that time;

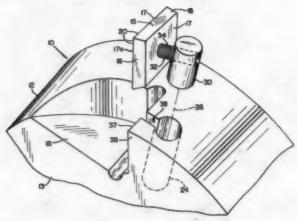
feeding a make-up amount of gas into the conduit after the conduit containing material has been closed off at its ends to compensate leakage losses and to insure the maintenance of the condition existing at the same time; and resuming the conveying operation by filling the conveyor container with material to be conveyed and matching the pressure in the conveyor container to the pressure in the conveyor conduit, whereafter the ends of the conveyor conduit are opened.

4,592,680

RETENTION SYSTEM FOR ROTARY CUTTER HAVING REPLACEABLE CUTTING INSERTS

Harold W. Lindsay, 2451 NW. 30th, Portland, Oreg. 97210

Filed Jan. 24, 1985, Ser. No. 694,443
Int. Cl.[4] B23C *5/24*
U.S. Cl. 407—36 **2 Claims**



1. In a rotary cutter comprising a rotatable holder having a work-facing surface, a recess extending inwardly of the work-facing surface and having an insert-supporting face, and a replaceable cutting insert received in the recess and supported by the supporting face, the insert having a side and a cutting face, the side and the cutting face cooperating to form a cutting edge, the insert having a centrally-disposed aperture, the aperture having an axis perpendicular to the cutting face,

the improvement comprising:

a cylindrical bore disposed in the holder, the bore having a generally radially disposed axis, the axis making an acute angle with the insert-supporting face of the recess, the bore forming a wedge-shaped portion in the holder between the bore and the insert-supporting face of the recess;

a transverse slot passing through the wedge-shaped portion of the holder;

a cylindrical locking member received in the bore and longitudinally displaceable therein; and

a locking screw having a shank and an insert-engaging head, the screw being received in the aperture of the insert, the head engaging the sides of the aperture, the shank of the screw passing through the slot in the wedge-shaped portion of the holder and threadedly engaging the locking member, the wedge-shaped portion of the holder causing increased tension in the screw due to centrifugal force during rotation of the cutter, the increased tension insuring retention of the insert in the holder during rotation thereof.

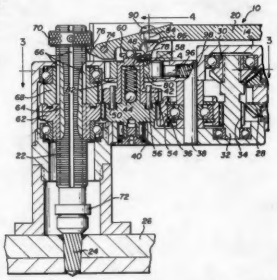
4,592,681

RETRACTION APPARATUS FOR AUTOMATIC FEED DRILLS OR THE LIKE

Robert A. Pennison, Bellville, and Richard E. Eckman, Houston, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 31, 1983, Ser. No. 547,702
Int. Cl.[4] B23B *45/04*
U.S. Cl. 408—10 **11 Claims**

1. Improved retraction apparatus for automatic feed drills including a housing, a rotatable tool spindle located for reciprocating movement in the housing, and driving means located in said housing operably connected with feeding and retraction movements, said driving means including a spindle rotation gear engaged with said spindle to rotate said spindle and slidable thereon, a spindle feed gear engaged with said spindle to cause the reciprocating movement of said spindle, a main drive gear driven by said drive means and engaged with said spindle rotation gear to cause rotation thereof, and a feed gear engaging said spindle feed gear movable into and out of engagement with said main drive gear, said feed gear, when driven by said main drive gear, causing rotation of said spindle feed gear to move said spindle in feeding movement, and, when not driven by said main drive gear, moving said spindle in retraction movement, the improvement comprising:



shift means connected to said feed gear and engageable with said spindle for moving said feed gear out of driving engagement with said main drive gear; and,

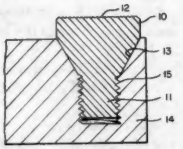
yieldable stop means in said housing engaging and preventing rotation of said feed gear when said feed gear is moved out of driving engagement with said main drive gear, said stop means being yieldable when a predetermined torque is placed on said feed gear by said spindle feed gear during retraction movement of said spindle whereby said spindle feed gear rotates at the same speed as said spindle thereby stopping the retraction movement of said spindle.

4,592,682

WEAR PADS

David M. Vanistendael, Washington, Pa., assignor to Davan Industries, Washington, Pa.

Filed Sep. 10, 1984, Ser. No. 649,209
Int. Cl.[4] B23Q *3/06*
U.S. Cl. 408—241 R **7 Claims**



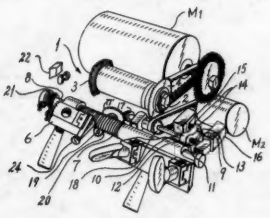
1. A wear pad assembly comprising a generally frusto-conical pad member, a support surface on the base of said frusto conical pad member to receive a work piece, a separate support base having a frusto-conical opening receiving in supporting and load bearing contact a major portion of the apex end of the frusto-conical pad member opposite the support surface whereby a minimum of material is removed from said support base while providing load support and attachment means removably connecting the apex end of the frusto-conical pad member with said base.

4,592,683

AUTOMATIC KEY CUTTING MACHINE

Kuo-shen Wu, No. 10, Alley 14, Lane 74, Pa Te Rd., Section 3, Taipei, Taiwan

Filed Nov. 30, 1983, Ser. No. 556,617
Int. Cl.[4] B23C 3/35
U.S. Cl. 409—83 5 Claims



1. An automatic key cutting machine comprising:
a motor for rotably driving a milling cutter;
a key carriage for holding a key sample to be copied and a key blank to be machined into the form of the sample by the milling cutter;
a guide structure along which the key carriage is linearly movable;
bias means for biasing the key carriage into a working position in which a key sample carried thereby is engaged by a guide secured on a frame of the machine, and in which a key blank carried by the carriage is engaged by said milling cutter;
a reversible rotary motor;
rotary-to-linear motion conversion means arranged to convert rotation of an output shaft of the reversible motor into linear movement, said conversion means including an output member linearly slidable along said guide structure and mounting the key carriage, the guide structure being in the form of a guide rod extending through an aperture in said output member and the key carriage being pivotal about the axis of the guide rod into its working position under the action of said bias means, said output member is lead screw serving as a rack gear, the lead screw being engaged by a pinion of the conversion means and having an axial aperture through which said guide rod passes, the key carriage being coupled to said conversion means such that operation of the reversible motor causes the key carriage to move along the guide structure in a direction dependent on the sense of rotation of said output shaft; and
a limit arrangement means for automatically deenergizing said reversible motor to stop the key carriage when the cutting of a key blank is complete, said limit arrangement means including a pair of spaced switches connected into the energization circuit of the reversible motor and a switch-operating member linearly reciprocable movable by said conversion means between said switches whereby to operate the latter at respective predetermined limit positions of the carriage along its guide structure.

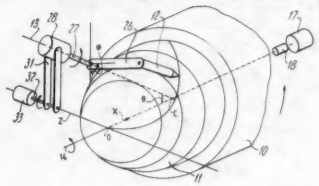
4,592,684

METHOD AND APPARATUS FOR PRODUCING ASPHERICAL SURFACES

Lionel R. Baker, Orpington, United Kingdom, assignor to Sira Limited, Chislehurst, United Kingdom

Continuation of Ser. No. 477,804, Mar. 22, 1983, abandoned.
This application Jul. 19, 1985, Ser. No. 756,573
Claims priority, application United Kingdom, Mar. 22, 1982, 8208277
Int. Cl.[4] B23C 3/04
U.S. Cl. 409—132 5 Claims

1. A method for producing an aspherical surface (11) on a workpiece (10) comprising: rotating the workpiece about a first axis (14), rotating a single point contact surface forming member (12) about a second axis (13) without linear translational movement more slowly than the rotation of the workpiece and at a radial distance from the second axis to form a surface on the workpiece, the second axis and first axis meeting at a point (C) and being at an acute angle (θ) with respect to one another, and progressively rotating without linear translational movement the second axis with respect to the first axis about a third axis (Z) passing through a pole (0) of the aspherical surface so that the point moves along the first axis, the acute angle between the first and second axes changes, and the surface forming member traverses a non-planar path of movement (22).

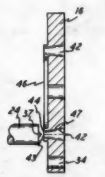


4,592,685

DEBURRING MACHINE

Richard F. Beere, 27234 Washington Ave., Waterford, Wis. 53185

Filed Jan. 20, 1984, Ser. No. 572,556
Int. Cl.[4] B23C 3/12
U.S. Cl. 409—138 8 Claims



1. A deburring machine for cutting chips from a work piece, comprising a power means having a rotary adaptor being rotatably mounted, a cutter mounted on said adaptor and being rotatable therewith and having a fully exposed planar face on a vertical plane and said cutter being spaced from any structure in front of and behind said cutter or in contact with said face, all for free-fall clearance of falling chips from said work piece, said cutter having a circular row of circular openings extending at a right angle into said planar face, and an upwardly open V-Block fixture mounted offset from the axis of rotation of said cutter and adjacent to but spaced from said planar face and having two horizontally spaced-apart and upwardly open and unobstructed V-surfaces free of any structure thereabove and with the Vees thereof pointing in the direction of rotation of said cutter and also disposed aligned with the longitudinal axis of said circular openings upon rotation of said cutter past said fixture, for presenting said V-surfaces upwardly to receive a work piece resting downwardly thereon to counter the force on said work piece when said cutter is rotated in said direction and to thereby remove a burr from said work piece by said arcuate cutting edges.

4,592,686

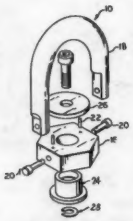
FASTENING DEVICE

Gary E. Andrews, 5199 Priorybrook Rd., Florissant, Mo. 63033

Continuation-in-part of Ser. No. 306,139, Sep. 28, 1981, Pat. No. 4,431,352. This application Feb. 9, 1984, Ser. No. 578,773

Int. Cl.[4] B23B *43/00*

U.S. Cl. 410—101 **5 Claims**



1. A fastening device for anchoring a load to a threaded base, the fastening device comprising:

(a) a stud including a head and a shank, said shank having a threaded portion adapted to be fastened to the base, and upper and lower unthreaded portions between the threaded portion and the head,

(b) a bushing member including an inner surface having an upper portion, and a lower portion at least the lower portion being bearingly engageable with the lower unthreaded portion of the stud, and an end bearing portion operatively engageable with the base, and

(c) load attaching means operatively connected to the bushing member in swivel relation for transferring applied load to the bushing member.

4,592,687

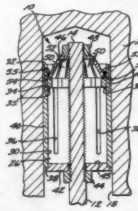
ROOF BOLT

Raymond Piersall, 927 Edgar St. Space 10, Beaumont, Calif. 92223

Filed Jul. 22, 1985, Ser. No. 757,616

Int. Cl.[4] F21D *21/00;* **F16B** *13/06*

U.S. Cl. 411—4 **20 Claims**



1. An expansion bolt for use in a pre-drilled hole of a pre-determined diameter in a structural layer, comprising:

an elongate stud having distal and proximal threaded ends;

a substantially cylindrical sleeve coaxially surrounding said stud and radially spaced therefrom near the distal end thereof, said sleeving having a plurality of axial slots extending from the distal end of said sleeve to a point distally spaced from the proximal end of said sleeve;

an internal shoulder extending radially from the interior surface of said sleeve, near the distal end of said sleeve;

first means on said stud for restraining the movement of said sleeve toward the proximal end of said stud;

a cam element threadedly attached to the distal end of said stud and having a plurality of circumferentially-spaced fingers extending proximally and radially outwardly to form a substantially frustoconical element having a greater diameter at its proximal end than at its distal end, the proximal ends of said fingers extending into the distal end of said expansion sleeve so as to be engageable with said shoulder;

a nut threadedly attached to the proximal end of said stud;

second means co-engaging said nut and said stud for holding said nut and said stud in a fixed rotational relationship until a pre-determined torque is applied to said nut; and

a plate carried on said stud between said nut and said first means so as to be axially movable thereon, and having a width larger than the diameter of said pre-drilled hole;

whereby said fingers of said cam element spread radially outwardly against the interior surface of said sleeve to cam the slotted portion of said sleeve radially outwardly as said nut and said stud are rotated together in a preselected direction, and whereby said second means allows said nut to be rotated in said preselected direction independently of said stud after said predetermined torque is applied, thereby to move said nut distally on said stud.

4,592,688

INSULATION HANGER AND METHOD

James W. Kramer, New Lebanon, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio

Filed Aug. 12, 1983, Ser. No. 522,555

Int. Cl.[4] F16B *21/02*

U.S. Cl. 411—349 **16 Claims**

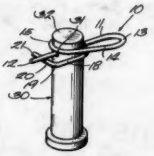
1. An insulation hanger assembly for securing blanket insulation to a wall, comprising a generally circular in section stud securable at its inner end to a wall, and a washer positionable on said stud; said stud including a locking section distorted to create bulges forming laterally projecting lugs of relatively short axial length, an anti-rotation section inwardly adjacent said locking section and distorted to create lateral bulges of substantially greater axial length but to a lesser lateral degree than the lug forming bulges of the locking section, and a rotation section which is free of locking or anti-rotation bulges and is of relatively short axial length inwardly adjacent said anti-rotation section; and said washer including an aperture means that allows the washer in a first rotational position to pass axially over said lugs but not in a second rotational position, to rotate at the rotational section of the stud between such first and second rotational positions, and to pass axially along the anti-rotation section of the stud from said rotation section to said locking section while rotationally interfering with the bulges of said anti-rotation section to prevent rotation of said washer to such first rotational position, whereby said washer may be positioned over the stud to the rotation section, rotated, and then moved outwardly along the anti-rotation section to engage and lock against the projecting lugs.

4,592,689

RING SPRING COTTER

Rue S. Leitzke, P.O. Box 537, Hustisford, Wis. 53034

Filed May 25, 1984, Ser. No. 613,812
Int. Cl.[4] F16B *21/18*
U.S. Cl. 411—358 **4 Claims**



1. In a spring ring cotter pin made of a single piece of wire having a first free end and a second free end the novelty comprising:

said wire having a straight run adapted to extend through a cotter hole and bent back on itself to form a ring having a leading edge above the straight run and a trailing edge below the straight run, the leading and trailing edges of the ring overlapping at the side of the straight run to form a fulcrum attached to a second free end of the wire, so that raising the second free end of the wire tilts the ring in a direction to permit the straight run and the first free end of the wire to be inserted in a cotter hole in such a manner that the ring encircles the shaft to be secured with both sides of said ring passing around said shaft simultaneously in the direction of movement of said straight run and lowering the second free end tilts the ring in a direction to capture the shaft to prevent withdrawal of the straight run from the cotter hole, said second free end comprising a portion bent at an angle to the fulcrum portion and extending upwardly and inwardly past the first free end.

4,592,690

HOT MELT GASKETING COMPOSITIONS AND PROCESSES FOR APPLYING THEM

Fred A. Busch, Clementon, N.J., assignor to Bonded Products, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 440,100, Oct. 8, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,487
Int. Cl.[4] B21D *51/46*
U.S. Cl. 413—19 **32 Claims**

1. A method of forming a gasket on the lid or cover of a container such as a drum or pail or the like, comprising:

(a) providing a hot-melt composition which comprises 25%–65% by weight of snythetic rubber copolymers mixed with 75%–35% of a plasticizer,

(b) rotating said cover or lid,

(c) applying said composition to said cover or lid while rotating, said rotation being at a speed low enough to prevent centrifugal force from causing dispersion of the applied composition, and

(d) permitting said applied composition to set.

4,592,691

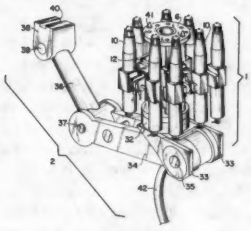
TELEMANIPULATOR FOR OPERATION IN A WATERBOX OF A STEAM GENERATOR

Bernard Lebouc, Courbevoie, and Georges Clar, Lyons, both of France, assignors to Framatome & Cie, Courbevoi, France

Filed Sep. 27, 1982, Ser. No. 424,771
Claims priority, application France, Oct. 5, 1981, 81 18669
Int. Cl.[4] B25J *15/00*
U.S. Cl. 414—4 **3 Claims**

1. A telemanipulator for operation in a waterbox of a steam generator and intended for attachment underneath a tubeplate of said generator, of the type having expandable grippers for engaging and locking as required in orifices in said tubeplate, mounted on arms carried by a bearer unit, with means for giving each arm, independently, (1) motions perpendicular to said plate in order to engage and disengage said grippers in said orifices, and (2) step-by-step motions parallel with said plate, thereby enabling independent movement of said apparatus underneath said tubeplate while keeping it suspended at all times by at least two grippers, wherein:

(a) said bearer unit supports four independent arms each equipped with two expandable grippers; and



(b) on its portion remote from said tubeplate, said bearer unit supports an arm having a number of members hinged together, an end member of said arm being equipped with tool attachment means, the entire said arm being in turn revolvable about the axis of said bearer unit perpendicular to said tubeplate;

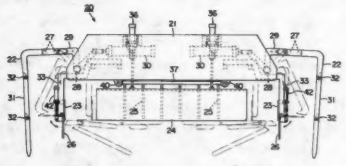
(c) and comprising remote-controlled means for adjusting and maintaining the angular position of said arm with respect to said bearer unit and the angular position of each of said members of said arm relative to one another.

4,592,692

PALLET LOADING APPARATUS

Dairi Suizu, Akashi; Taketoshi Kishimoto, and Tadahiro Hayashida, both of Kakogawa, all of Japan, assignors to Okura Yusoki Kabushiki Kaisha, Hyogo, Japan

Filed Feb. 19, 1985, Ser. No. 702,939
Claims priority, application Japan, Feb. 23, 1984, 59-33036
Int. Cl.[4] B65G *57/03*
U.S. Cl. 414—70 **1 Claim**



1. In a pallet loading apparatus comprising means defining a package supporting surface at a package pickup station, means defining a pallet supporting surface at a pallet station which is spaced in a forward direction from said package pickup station, a movable frame, guide means confining said movable frame to movement in said forward direction and an opposite rearward direction and to vertical movement down to and up from a level at which the movable frame is spaced above said surfaces, and a pair of sets of fork members, one set adjacent to each of the laterally opposite sides of said frame, the fork members of each set being spaced apart in said forward direction and being constrained to partake of movements of said frame but being movable in unison relative to said frame between a closed position in which they cooperate with the fork members of the other set to support a package and an open position, the sets of fork members thus being cooperable with one another and said

frame for picking up packages at said package pickup station, carrying them forward to said pallet station and depositing them on a pallet at said pallet station, said pallet loading apparatus being characterized by:

A. a supporting shaft on said frame for each set of fork members, each said support shaft
(1) extending along the lateral side of said frame that is adjacent to its set of fork members and
(2) being confined to rotation on said frame;

B. every fork member of each set being substantially L-shaped and comprising
(1) an elongated upper section with upper and lower ends which has at its upper end a rigid connection with its supporting shaft and which in said closed position projects downward to a level beneath said frame, and
(2) an elongated supporting section having one end connected to the lower end of said upper section and having an opposite tip end, said supporting section in said closed position projecting laterally inwardly beneath the frame from said upper section for supportingly underlying a package, said rigid connection enabling the fork members of the set to be swung between said closed position and said open position wherein said upper section projects laterally outwardly from the frame and said supporting section projects downwardly;

C. the supporting section of every fork member having a joint
(1) which is spaced along the supporting section from the tip end thereof and which defines an elongated swingable element of the supporting section that extends from said joint towards said tip end and
(2) about which said swingable element is confined to swinging, through positions in which it extends at acute angles to said upper section, to and from a limit position in which it extends at substantially a right angle to said upper section; and

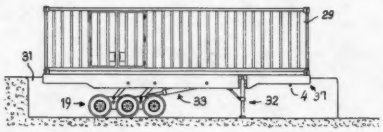
D. a pair of package engaging members on said frame, one adjacent to each of said laterally opposite sides thereof, each having an upper portion and a lower portion,
(1) said upper portion of each package engaging member being beneath said frame and
(a) defining an upright surface that extends in said directions and opposes the upper portion of the other package engaging member and
(b) being laterally inside the set of fork members at its side of the frame, and
(2) said lower portion of each package engaging member
(a) being so connected with its upper portion as to be confined to movement relative thereto between
(i) an operative position in which a package engaging surface on the lower portion is below and substantially coplanar with said upright surface on its upper portion and
(ii) a retracted position in which the lower portion is mainly disposed laterally outwardly of its upper portion and at a level no lower than that of the bottom edge of its upper portion, and
(b) having apertures through which the supporting sections of the fork members at its side of the frame can extend,
(3) said package engaging members being movable laterally relative to said frame towards and from one another to cooperate in confining packages between them against lateral displacement as the sets of fork members are swung to their open positions.

4,592,693

CARRYING PLATFORM FOR RECEIVING A GOODS VAN OR CONTAINER AND PROVIDED WITH MEANS FOR ITS ADAPTATION TO TRANSPORT BY ROAD, RAIL AND SEA

Pierre G. J. Perrot, 14 Rue de l'Abreuvoir, 27320 Nonancourt, France

Filed Dec. 22, 1983, Ser. No. 564,509
Claims priority, application France, Dec. 22, 1982, 82 21540
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—495 **10 Claims**



1. A carrying platform (37) for receiving a goods van or container and in separable combination with a support (39) which is selectively a railway bogie, a road bogie, a tracked road bogie and a support structure in a boat for transporting the van or container selectively by railway, road and sea, said platform comprising a frame having two parallel longitudinally-extending side-members (100) which have two opposed end portions (200) and an intermediate portion interconnecting said end portions, cross-members (500) interconnecting said side-members, two plate structures (400) respectively interconnecting said two opposed end portions of said two side-members, rolling devices (151) including first free-running rollers (152) having axes of rotation extending transversely of said platform, said rolling devices being connected to said two end portions of said side-members so that said first free-running rollers (152) project downwardly from an underside of said plate structures (400) for directly engaging said support and allowing free displacement of said platform longitudinally of said support, a road set of wheels (18, 41) movably mounted on said platform and movable between selectively a retracted position, a road engaging position and an extended position beyond said road engaging position, hydraulic prop structures (32) movably mounted on said platform and movable selectively between a retracted position, a road engaging position and an extended position beyond said road engaging position, and hydraulic jacks (110) mounted on said platform for selectively raising and lowering said platform and operative, in combination with said prop structures, to permit selectively raising said platform for transferring said van or container to a loading platform and removing said van or container from said loading platform and then lowering said platform, and means (156, 167, 168, 173, 580) for positioning the platform relative to the support and retaining the platform on the support.

4,592,694

MODULAR BOAT TRAILER

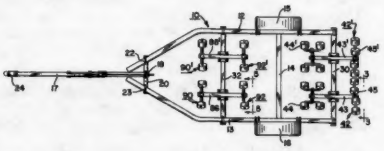
Lawrence N. Johnson, Spokane, Wash., assignor to EZ Loader Boat Trailers, Inc., Spokane, Wash.

Continuation of Ser. No. 936,521, Aug. 24, 1978, abandoned. This application Dec. 23, 1982, Ser. No. 452,793
Int. Cl.[4] B60P *3/10*
U.S. Cl. 414—534 **9 Claims**

1. A boat trailer comprising
two elongated side frame members (12, 13) positioned adjacent to each other and supported on a spring-connected wheel bearing axle (14) for movement over a roadway surface,
each one of said side frame members having a forward tongue forming portion converging toward the other one of said side frame members for connection to a towing vehicle and a rear boat-supporting portion extending

parallel to the other one of said side frame members for supporting a boat thereupon,

said parallel extending boat-supporting portions of said side frame members defining an area therebetween throughout the parallel extending length thereof which is free of any cross frame members rigidly connected between the boat-supporting portion of one of said side frame members and the boat-supporting portion of the other one of said side frame members,



at least one boat-supporting cross member (30) extending between and pivotally connected (35) to said parallel boat-supporting portions of each of said side frame members for fore and aft pivotal movement relative thereto for supporting a boat placed on the boat trailer and effecting the parallel spacing between said boat-supporting portions of said side frame members, and

boat hull engaging support means (42) carried by said boat-supporting cross member for pivotal movement therewith relative to said elongated side frame members to facilitate loading and launching a boat.

4,592,695

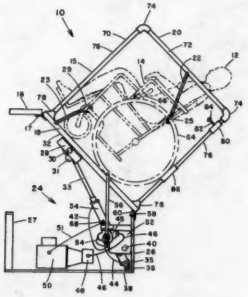
SHAMPOO LIFT FOR A WHEELCHAIR

Sylvia J. McConnell, P.O. Box 4048, Opelika, Ala. 36801

Filed Oct. 19, 1984, Ser. No. 662,578

Int. Cl.[4] A47C *31/00*

U.S. Cl. 414—678 **3 Claims**



1. A tilting platform lift device capable of securely holding a wheelchair with a person in said wheelchair and tilting said wheelchair backwards for giving said person a shampoo, comprising:

a base comprising a rectangular case and two vertical supports attached to the front of said case;

a tilting platform attached to said base, said platform comprising a rectangular platform floor;

means attached to said platform floor for tilting said platform, said means comprising an operating system mounted in said case, said operating system comprising:

a double-acting hydraulic cylinder, one end of said cylinder being attached to said case and the opposite ends of said cylinder being attached to said platform floor;

a suitable quantity of hydraulic fluid in said system;

a four-way hydraulic control valve;

first and second hydraulic lines connecting said control valve to said double-acting cylinder, the first said line being connected to one end of said cylinder and the second said line being connected to the other end of said cylinder;

an electric motor mounted in said case;

a hydraulic pump attached to said motor, for providing pressure to said operating system;

a third hydraulic line connecting said pump and said control valve, for providing hydraulic pressure to said control valve and other portions of said operating system;

a hydraulic reservoir mounted in said case, for providing said hydraulic fluid to said system;

a fourth hydraulic line connecting said valve and said reservoir; and

an operating lever attached to said four-way control valve for operating said tilting platform lift so as to cause said double-acting cylinder to tilt said platform either backwards or forwards under power;

means attached to said platform for securely holding a wheelchair on said paltform; and

a piano hinge attached to the back edge of said platform floor and to the back edge of said rectangular case, for permitting said operating system to tilt said platform backwards and upwards.

4,592,696

MATERIAL WORKING MACHINES

Frederick A. Carternock, Folkestone, United Kingdom, assignor to Pulsar International Limited, Guernsey, Channel Islands

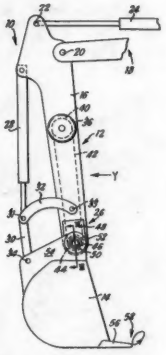
PCT No. PCT/GB82/00155, § 371 Date Feb. 1, 1983, § 102(e) Date Feb. 1, 1983, PCT Pub. No. WO82/04274, PCT Pub. Date Dec. 9, 1982

PCT Filed May 28, 1982, Ser. No. 466,345

Claims priority, application United Kingdom, Jun. 1, 1981, 8116624

Int. Cl.[4] E02F *3/42*

U.S. Cl. 414—685 **17 Claims**



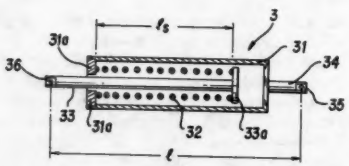
1. A material working machine having an implement for working on said material, support means supporting said implement, means for applying non-vibratory forces for the operation of the implement, and separate vibratory means for applying vibratory forces for vibrating the implement such that, in use, a working portion of the implement for engaging said material performs a closed curve motion during each cycle of vibration, wherein the vibratory means is driven by constant-power driving means which automatically responds to any variations in the load applied to the implement at any instant of its operation.

4,592,697

GRAVITY BALANCING DEVICE FOR ROCKING ARM

Goro Tuda, Kobe; Hironosuke Kada; Teruyoshi Sekino, both of Fujisawa, and Yasuhide Nagahama, Kamakura, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 26, 1983, Ser. No. 488,721
Int. Cl.[4] B25J *19/00*
U.S. Cl. 414—719 5 Claims



1. A gravity balancing device for offsetting a gravitational moment of a rocking arm, mounted between a fixed point located above a pivotal point of said rocking arm at a predetermined distance a and substantially in vertical alignment therewith, and an arbitrary point on said arm, said gravity balancing device comprising:

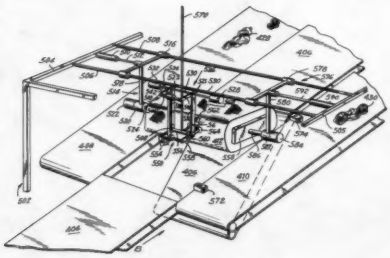
compression spring means having a spring constant k of a value equivalent to a load W at said arbitrary point as divided by said predetermined distance a, and a free length equal to a sum of the length l between said fixed and said arbitrary point and an initial mounted length l_s of said compression spring for applying a counterbalancing tensile force varying in proportion to the distance between said fixed point and said arbitrary point on said arm.

4,592,698

PROCESS FOR REMOVING COVERING MATERIAL FROM TOBACCO BALES

Bernard A. Semp, and Robert B. Giovenco, both of Richmond, Va., assignors to Philip Morris Inc., New York, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,292
Int. Cl.[4] B65G *65/02*
U.S. Cl. 414—786 18 Claims



1. A process for removing covering material from a bale of material comprising the steps of

orienting a covered bale of material on a conveying means;

conveying the covered bale of material with the conveying means to a covering removal apparatus;

introducing the covered bale of material into the covering removal apparatus on the conveying means;

stopping the covered bale of material within the covering removal apparatus;

engaging each opposing end of the covered bale of material, respectively, with one of a pair of engagement means and extending means from each of the engagement means to separately engage the covering material;

lifting the covered bale of material held between the pair of engagement means;

activating at least one water knife and moving the water knife from a noncutting position to a cutting position adjacent to the covered bale of material;

rotating the covered bale of material held between the pair of engagement means with the water knife in the cutting position;

cutting the covering material with water knife during the rotating step and causing only minimal damage to the underlying bale of material and only minimal contamination of the underlying bale of material with particles, fragments and/or fibers of the covering material;

stopping rotation of the covered bale of material after a predetermined number of revolutions;

deactivating the water knife and moving the water knife from the cutting position to the noncutting position;

uncovering the underlying bale of material by moving the respective engagement means away from the opposing ends of the underlying bale of material while still engaging the covering material with the means extended from each of the engagement means;

removing the uncovered bale of material from the covering removal apparatus;

releasing the covering material from the engagement means; and

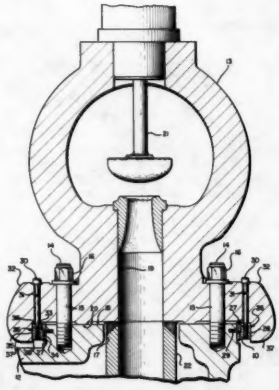
removing the covering material from the covering removal apparatus.

4,592,699

CLAMPING ASSEMBLY

Joseph Maierbacher, Wellsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 5, 1984, Ser. No. 585,953
Int. Cl.[4] F01D *25/24*
U.S. Cl. 415—126 9 Claims



1. In a steam turbine assembly having a turbine casing provided with a first port in fluid communication with a turbine wheel mounted within the casing and surrounded by a first rim portion, a steam chest casing provided with a second port surrounded by a second rim portion sized to mate with the first rim portion in an abutting relationship, a steam injection nozzle secured to said second port and projecting through said first port in spaced relationship with blades of said turbine such that a distal end of said nozzle is positioned for steam discharge on said blades of said turbine wheel, and a fastening means adapted to secure the casings together in an abutting fashion

forming a gas-tight seal between the rim portions, the improvement comprising a clamping assembly for aligning and clamping the casings together comprising:

a. at least two wedge assemblies, one positioned on one side of said abutting rim portions and the other positioned on an opposed side of said abutting rim portions, each of said wedge assemblies including:

(i) a first wedge key on the periphery of the turbine casing, said key having an outer surface diverging outwardly from the turbine casing toward the steam chest casing;

(ii) a second wedge key on the periphery of the steam chest casing having an inner surface adapted to engage the outer surface of the first key; and

b. adjustable means coupled to each of said wedge assemblies for adjusting said spacing between said nozzle and said blades along the turbine axis in either direction by loosening one of said wedge assemblies and tightening the other of said wedge assemblies and for clamping said steam chest to said turbine casing by simultaneously tightening both of said wedge assemblies.

4,592,700

VORTEX PUMP

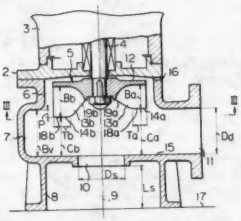
Seiichi Toguchi, and Makoto Kobayashi, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,441

Claims priority, application Japan, Mar. 10, 1983, 58-38210

Int. Cl.[4] F04D *29/24, 29/40*

U.S. Cl. 415—213 A **8 Claims**



1. A vortex pump comprising:

a pump casing consisting of an impeller chamber and a vortex chamber communicating with said impeller chamber, said vortex chamber being provided with a suction opening at a portion opposite said impeller chamber and a discharge opening, said impeller chamber and said suction opening being axially aligned;

a motor supported on said casing and having a shaft, the distal end of which extends into said impeller chamber in axially aligned relation therewith; and

an impeller of an open type having a main plate and plural blades on one side of said main plate and mounted on said distal end of said shaft so as to be disposed in said impeller chamber so that said blades face said suction opening;

said vortex pump being characterized in that: said plural blades are grouped into at least two groups, one being a group of wide blades and the other being a group of narrow blades, the axial width of each of said wide blades being broader than the axial width of each of said narrow blades so that the open end edges of said wide blades extend into said vortex chamber, each of the blades being shaped to have an open end edge comprising a parallel portion parallel to said main plate and a slanted portion inclined upwardly from a region near the center of the impeller toward said parallel portion, said wide and narrow blades being arranged circumferentially while keeping an equiangular relationship with each other so as to provide a dynamic and hydraulic balance to said impeller, the number and configuration of the wide and narrow blades being selected and determined so that a flow passage is formed from said suction opening to said discharge opening through said vortex chamber to allow the passing of a sphere having a diameter equivalent to the distance between the open end edges of said narrow blades and the inner surface of the wall of said vortex chamber provided with said suction opening, whereby any foreign material sucked into the suction opening is discharged out of the suction opening, the inclined angle of said slanted portion relative to said main plate being greater in the said wide blade than the inclined angle in said narrow blade.

4,592,701

ROTOR BLADE, ESPECIALLY FOR A ROTARY WING AIRCRAFT

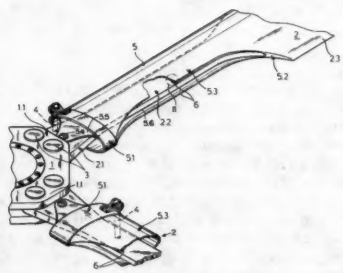
Michael Hahn, Ottobrunn; Otmar Friedberger, Neubiberg, and Gerhard Singer, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,472

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401737

Int. Cl.[4] B64C *27/33*

U.S. Cl. 416—134 A **5 Claims**



1. in a rotor blade for connection to a rotor hub, especially for a rotary wing aircraft, having a radially outer blade wing section, a radially inner blade root section for connection to said rotor hub, and a blade neck section interconnecting said blade wing section and said blade root section in a torsionally yielding manner, the improvement comprising a torsion stiff blade angle control sleeve bridging said blade neck section without contacting said blade neck section for transmitting blade angle adjustment torque moments to said blade wing section, said torsion stiff sleeve having a circumferentially closed radially outer end, first means rigidly connecting said circumferentially closed radially outer end of said torsion stiff sleeve to said blade wing section, said torsion stiff sleeve further having a circumferentially closed radially inner end connectable to blade angle adjustment means for adjusting a blade angle through said torsion stiff sleeve, second means for flexibly connecting said circumferentially closed radially inner end of said torsion stiff sleeve to said blade root section, said torsion stiff sleeve further comprising a leading edge, a trailing edge and a longitudinal inspection gap in said trailing edge, said longitudinal inspection gap extending intermediate said circumferentially closed radially inner and outer ends of said torsion stiff sleeve for visually inspecting said torsionally yielding blade neck section through said inspection gap, said torsion stiff sleeve having a reinforced upper longitudinal edge and a reinforced lower longitudinal edge along said inspection gap for compensating any loss in torsion stiffness of said torsion stiff sleeve due to said inspection gap, whereby said torsion stiff sleeve permits a proper blade angle adjustment and also a visual inspection of said blade neck section.

4,592,702

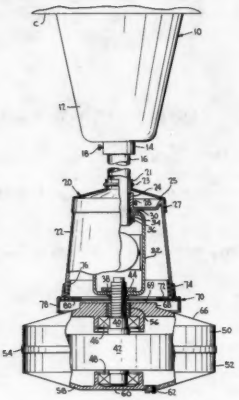
WATERPROOF FAN

Gerald I. Bogage, 12019 SW. 114th Pl., Miami, Fla. 33176

Filed Aug. 22, 1983, Ser. No. 525,471

Int. Cl.[4] F04D *29/08*

U.S. Cl. 416—247 R **2 Claims**



1. A waterproof fan comprising

mounting means including a support rod (16) being adapted to support the fan in a suspended manner,

an electric motor (42) adapted to rotate the fan and electric control means therefor,

a housing (50–52) for said electric motor (42),

a canopy (22) covering said electric controls and having a top portion (24) secured to said support rod (16) and a bottom portion disposed adjacent said housing,

sealing means secured to said support rod (16) adjacent the top portion (24) of said canopy (22) to inhibit water from entering therein, and

a waterproof cowling (70) for the bottom portion of said canopy (22) having a first part secured to said bottom portion to inhibit water from entering therein and having a second part projecting toward said housing (50–52) to divert water away therefrom,

said waterproof cowling (70) including a generally flat annulus (72), and first part including a U-shaped sealing member (74–76) extending upwardly from said flat annulus (72) to receive the bottom portion of said canopy (22), and said second part including a skirt (78) extending from said annulus (72) in a direction generally opposite to said U-shaped sealing member (74–76) toward said housing (50–52).

4,592,703

SCROLL COMPRESSOR

Tsutomu Inaba; Toshiyuki Nakamura, and Tadashi Kimura, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,349

Claims priority, application Japan, Mar. 26, 1983, 58-50834

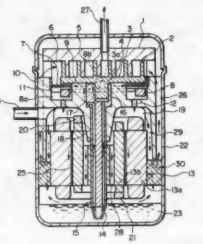
Int. Cl.[4] F04B *39/06, 39/02;* **H02K** *9/08*

U.S. Cl. 417—366 **13 Claims**

1. In a scroll compressor comprising a stationary scroll and an orbiting scroll forming a compression chamber therebetween; an Oldham coupling for maintaining said orbiting scroll at a constant angle with respect to said stationary scroll; a crankshaft for transmitting a drive force to said orbiting scroll; a frame supporting said crankshaft; a motor secured to said frame for driving said crankshaft; and a housing accommodating at least said stationary scroll, said orbiting scroll and said motor, wherein a compression unit including said stationary scroll and said orbiting scroll is arranged in an upper portion of said housing and said motor is arranged in a lower portion of said housing, the improvement comprising:

first and second flow paths, said first flow paths having upper ends communicating with a motor chamber formed at an upper portion of said motor, lower ends opening above an oil pool in said housing and portions downstream of said lower ends entering said second flow paths, said first flow paths extending in an axial direction of said compressor and passing through interior portions of said motor; and

said second flow paths extending in the axial direction of



said compressor and including a first, downward portion extending between said frame and an exterior surface of said motor, said downward section being substantially axially shorter than said motor, a second, upward portion extending between said frame and said housing and sharply bending direction changing portions between said first and second portions, said direction changing portions of said second flow paths constituting lower portions of said second flow paths and being located substantially above and isolated from said oil pool, said second flow paths joining said first flow paths near said sharply bending portions and having upper ends communicating with said compression unit.

4,592,704

MOTOR WITH IMPROVED LOW-SPEED OPERATION

George S. Beniek, Chanhassen, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 586,378, Mar. 5, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,667

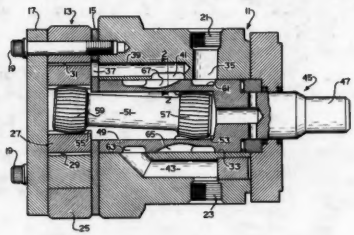
Int. Cl.[4] F03C *2/08;* **F16K** *3/26*

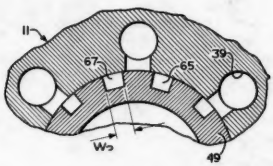
U.S. Cl. 418—61 B **8 Claims**

1. A rotary fluid pressure device, especially adapted for operation at relatively low speed, of the type including housing means defining a fluid inlet port and a fluid outlet port; a fluid energy-translating displacement mechanism associated with said housing means and including an internally-toothed member and an externally-toothed member eccentrically disposed within said internally-toothed member, one of said members rotating about its own axis and one of said members orbiting about the axis of the other of said members, the teeth of said members interengaging to define expanding and contracting fluid volume chambers during said orbital and rotational movement; valve means including a stationary valve member defining a plurality N+1 of stationary fluid ports wherein N is equal to the number of teeth on the externally-toothed member, each of said stationary fluid ports being in continuous fluid communication with one of said fluid volume chambers, each of said stationary fluid ports having a port width W_1, said valve means further including a rotary valve member operable to rotate in synchronism with said one of said toothed members having rotational movement, said rotary valve member defining a fluid chamber in continuous fluid communication with said fluid inlet port and a plurality N of rotary fluid ports in com-

munication with said fluid chamber, each of said rotary fluid ports having a port width W_2, characterized by:

one of said port widths W_1 and W_2 being selected, relative to the other, to be narrower than the other to such an extent





that the maximum leakage, during rotation of said rotary valve member, is approximately equal to the minimum leakage to minimize leakage fluctuation during relatively low-speed operation, whereby performance during such low-speed operation is optimized.

4,592,705

LUBRICATION FOR ROTARY COMPRESSOR VANE

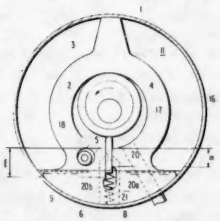
Sei Ueda; Takuho Hirahara; Koji Ishijima; Fumiaki Sano; Kazutomo Asami, and Fumio Wada, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,300

Claims priority, application Japan, Mar. 6, 1984, 59-42533

Int. Cl.[4] F04C *18/00, 29/02*

U.S. Cl. 418—63 **6 Claims**



1. A rotary vane compressor including a cylinder member **(3)**, an eccentrically driven circular piston **(4)** rotatably disposed within the cylinder member, a radial slot **(20)** formed in the cylinder member, a blade-like vane **(5)** slidably disposed within the slot, spring means **(6)** biasing the vane radially inwardly such that a tip thereof abuts the piston and attendantly separates the cylinder member into low pressure and high pressure, variable volume chambers **(17, 18)**, and a lubricant oil passageway **(21)** formed in the cylinder member and communicating with a radially outermost end of the slot, characterized by:

the radial length m of a wall **(20*a*)** of the slot of a low pressure side of the vane, as measured from an innermost point lying at a radius r from a center of the cylinder member to an outermost point, being shorter than the radial length l of an opposite wall **(20*b*)** of the slot on a high pressure side of the vane, as measured from an innermost point also lying at a same radius r from the center of the cylinder member to an outermost point, to enhance lubrication, attendantly reduce wear, and facilitate the flushing away of abrasive particles.

4,592,706

INTERNAL GEAR PUMP WITH BRANCHED INTAKE PLENUM

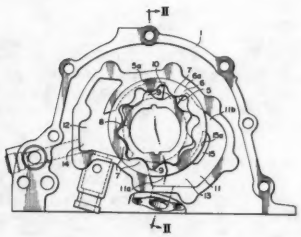
Masashi Matsuo, Toyota; Yasushi Miura, and Hideki Nakayoshi, both of Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Sep. 17, 1985, Ser. No. 776,838

Claims priority, application Japan, Sep. 27, 1984, 59-146385[U]

Int. Cl.[4] F01C *1/10, 21/10*

U.S. Cl. 418—171 **3 Claims**



1. An internal gear pump comprising:

(a) a pump housing formed with a rotor receiving cavity which has a cylindrical circumferential inner wall surface;

(b) an outer rotor formed with a generally cylindrical outer surface which fits closely and coaxially in said cylindrical circumferential inner wall surface of said rotor receiving cavity and is rotatable around their mutual central axis within said pump housing, and which is further formed with an inner cavity the defining surface of which is formed with a plurality of internally facing teeth; and

(c) an inner rotor, somewhat smaller than said inner cavity of said outer rotor, which is formed with a plurality of externally facing teeth which mesh and cooperate with said internally facing teeth of said outer rotor;

(d) a pumping chamber being defined between the outer surface of said inner rotor and the inner surface of said outer rotor between the mutually meshing teeth thereof; and

(e) an aperture being formed in said pump housing to define an intake plenum, said aperture opening to define an intake port structure through several portions of said circumferential inner wall surface of said rotor receiving cavity, at least one remaining portion of said circumferential inner wall surface of said rotor receiving cavity intervening between separate such several portions of said circumferential wall surface of said rotor receiving cavity which are removed to allow said intake port structure to open therethrough.

4,592,707

DEVICE FOR ROUNDING OFF GRANULAR PARTICLES OF SOLID MATERIAL

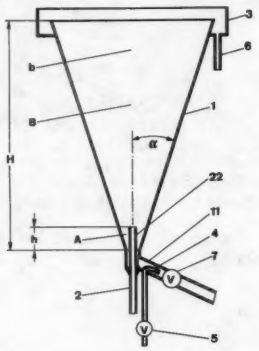
Werner Borer, Flurlingen; Janos Lukacs, Ettikon, and Hugo Spalinger, Dornach, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 446,328, Dec. 2, 1982, Pat. No. 4,476,071. This application Apr. 12, 1984, Ser. No. 599,698

Claims priority, application Switzerland, Dec. 23, 1981, 8244/81

Int. Cl.[4] B29C *67/00*

U.S. Cl. 425—7 6 Claims



1. A device for treating particles of hard comminuted granulate material of any given irregular shape with a liquid stream so as to round off said particles comprising a substantially funnel-shaped container having an angle between the longitudinal axis and the wall of the container and a first nozzle for introducing a liquid stream into said funnel-shaped container, said first nozzle being located in the bottom of said substantially funnel-shaped container along the longitudinal axis of said funnel-shaped container which projects into the container to a height of not more than 1/10 H where H is the height of the container wherein said substantially funnel-shaped container is provided with a run-out at the bottom thereof, said run-out being provided with a second nozzle for selectively introducing additional liquid into said container.

4,592,708

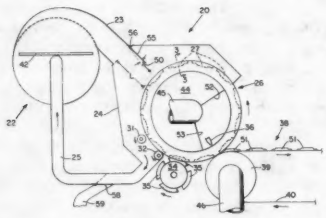
APPARATUS FOR MAKING AIRLAID ARTICLES

Barry R. Feist, Cincinnati; Jerry E. Carstens, Mason, and David A. Peterson, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 1, 1984, Ser. No. 576,098

Int. Cl.[4] B27N *3/14*

U.S. Cl. 425—80.1 18 Claims



1. In an improved apparatus for making discrete airlaid articles which apparatus includes a foraminous deposition member, means for directing air-entrained fibers towards said foraminous deposition member, said deposition member being configured to have an endless series of discrete article formation cavities presented to said stream of air-entrained fibers, and means for vacuum exhausting the entrainment air from the apparatus, the improvement wherein said means for directing said air-entrained fibers comprises means for directing a spatially stationary, substantially columnar stream of air having discrete fibers entrained therein substantially perpendicular towards only a predetermined first span of said deposition member, and wherein said means for vacuum exhausting said entrainment air comprises means for the bulk of said entrainment air to be vacuum exhausted from said apparatus by being drawn through a second span of said deposition member disposed upstream from said columnar stream of air and said first span, and for the remainder of the entrainment air to be drawn through said first span.

4,592,709

APPARATUS FOR INSERTION STICKS INTO FREEZING POCKETS

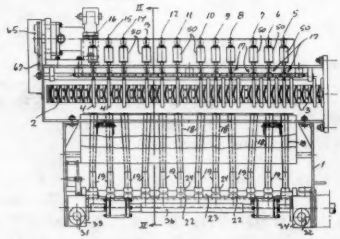
Klaus Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Nov. 21, 1984, Ser. No. 673,896

Claims priority, application Denmark, Dec. 5, 1983, 2986/83

Int. Cl.[4] B29C *41/20*

U.S. Cl. 425—126 S 7 Claims



1. An apparatus for inserting individual sticks into respective freezing pockets which are arranged in a row in a freezing machine, said apparatus comprising

a feeding means for delivering a plurality of individual sticks to respective discharge positions, said freezing means including a plurality of spaced apart grooves in which said individual sticks are removably positioned,

a separate flicking device for removing each individual stick from its associated groove in said feeding means when in its associated discharge position, each flicking device including an operating element which is movable toward and away from an associated stick on said feeding means,

activation means which is movable in a path of travel to contact each operating element of each flicking device to cause it to discharge an associated stick from said feeding means,

an activatable arresting means associated with each flicking device, each arresting means, when activated, moving the operating element of the associated flicking device out of the path of travel of said activation means to prevent it from discharging an associated stick from said feeding means, said activatable arresting means including an electromagnet,

a control device connected to the electromagnet of each activatable arresting means to control its activation, and

means for inserting each individual stick which has been discharged from a groove in said feeding means into a respective freezing pocket in said row of freezing pockets in a freezing machine.

4,592,710
EXTRUDER PRESS UNIT FOR EXTRUDING THERMOPLASTIC MATERIAL

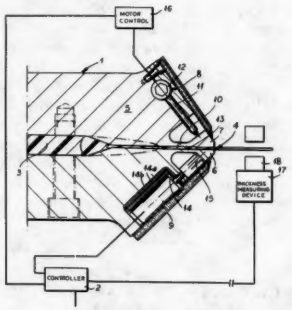
Hans Reifenhäuser, Troisdorf; Heinz Beisemann, Cologne; Paul Reitemeyer, and Robert Grabowski, both of Troisdorf, all of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co., Maschinenfabrik, Fed. Rep. of Germany

Filed Jul. 25, 1985, Ser. No. 759,053

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427912

Int. Cl.[4] B29C *47/92*; H01L *41/00*

U.S. Cl. 425—141 **11 Claims**



1. In an extruder press unit for extrusion of thermoplastic materials comprising an extruder body having at least one output gap, which is defined by an output gap-defining adjustable extruder lip and an opposing gap-bounding lip, whereby said output gap in said extruder body is adjustable to a specified gap width with the aid of a coarse adjusting mechanism and said output gap-defining adjustable extruder lip is connected to at least one adjusting element, to which a control and adjusting device for regulating the thickness of the extruded plastic product is associated, the improvement wherein

said opposing gap-bounding lip is constructed as an adjustable component on said body;

said coarse adjusting mechanism operates on said opposing gap-bounding lip;

said adjusing element is a field translator; and

said control and adjusting device is designed for a fine gap size adjustment of between 0.05 and 0.3 mm of said field translator.

4,592,711
APPARATUS FOR FABRICATING PLASTIC PARTS

Gilbert Capy, La Botte, Jarnioux, Rhone, France

Filed Dec. 1, 1983, Ser. No. 557,053

Claims priority, application France, Mar. 10, 1983, 83 04341

Int. Cl.[4] B29C *45/22, 45/78*

U.S. Cl. 425—144 **11 Claims**

1. An apparatus for injection molding plastic parts, said apparatus comprising:

extrusion means having an outlet, said extrusion means supplying pressurized molten plastic material to said outlet;

mold means disposed adjacent said extrusion means;

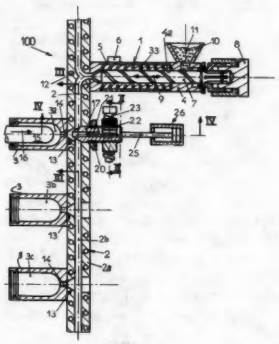
a plurality of cavities formed in said mold means;

a runner means having an elongated passage extending from said outlet of said extrusion means to said plurality of cavities such that said pressurized molten plastic material is available to continuously flow along said elongated passage from said outlet to said plurality of cavities;

a plurality of gates located between said elongated passage and each of said plurality of cavities for communicating said molten plastic material to each of said plurality of cavities;

a plurality of dosage valve means slidably mounted to said runner means, said plurality of dosage valve means disposed adjacent to said plurality of gates, each of said plurality of dosage valve means extending into said elongated passage adjacent a respective gate of said plurality of gates, each of said plurality of dosage valve means having a nozzle member adjustably positioned adjacent said associated gate of said plurality of gates, such as to be selectively movable towards and away from said associated gate to communicate a predetermined dosage of pressurized molten plastic material from said elongated passage along said associated gate of said plurality of gates into said mold means;

means for adjusting the position of said nozzle member of



each of said plurality of dosage valve means, said means for adjusting being juxtaposed said nozzle member of each of said plurality of dosage valve means; and

shut-off valve means interconnected with each of said plurality of dosage valve means, said shut-off valve means selectively operable to close said mold means to the flow of pressurized molten plastic material from said elongated passage to said plurality of cavities such that a predetermined dosage of molten plastic material supplied to said mold means is metered by selectively opening and closing said shut-off valve means for a predetermined period of time and by the selective positioning of each of said nozzle members with respect to each of said plurality of gates.

4,592,712
PLASTIFICATION AND INJECTION DEVICE FOR AN INJECTION MOLDING MACHINE

Lothar Gutjahr, Denzlingen, Fed. Rep. of Germany, assignor to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 463,113, Feb. 2, 1983, abandoned. This application May 14, 1985, Ser. No. 734,243

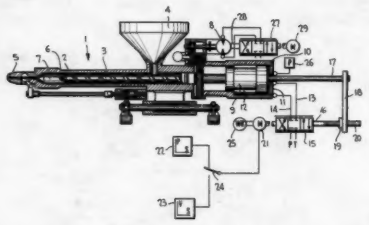
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203763

Int. Cl.[4] B29C *45/54*

U.S. Cl. 425—145 **4 Claims**

1. A plastification and injection device for an injection molding machine, comprising a screw housing having an inlet for granular plastic material and an outlet nozzle, an injection screw mounted within said housing and having a tip end spaced from said outlet nozzle to therewith define a plasticizing chamber, means for axially rotating said screw in one direction for thereby plasticizing the material fed into said housing, a hydraulic piston and cylinder unit for axially shifting said screw for injecting plasticized material from said chamber through said nozzle, said unit comprising a cylinder affixed to said housing and a piston connected to said screw, said piston defining with said cylinder a piston extension chamber and a piston retraction chamber, hydraulic means for operating said piston and cylinder unit, said means comprising

hydraulic feed lines connecting said chambers and a first multi-directional control valve in said lines, a linear amplifier having hydraulically fixed feedback and comprising said valve which is mounted for shifting movement to control the flow of hydraulic fluid through said lines for axially shifting said screw, an elongated threaded rotatable spindle threadedly connected with said piston, said first valve being mounted on said spindle



such that the shifting movement thereof is effected upon spindle rotation, a first stepping motor coupled to said spindle for rotation of said spindle in accordance with the injection pressure and/or the rate of injection, whereby rotation of said spindle effects the movement of said first valve to control the flow of hydraulic fluid, the movement of said piston effecting an oppositely directed movement of said first valve via said spindle which is counteracted by said first motor.

4,592,713

MOLD CLOSING UNIT OF AN INJECTION MOLDING MACHINE

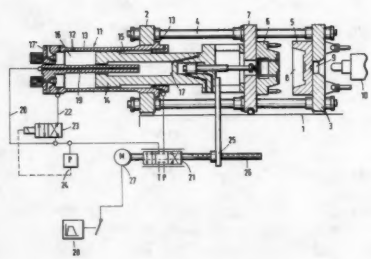
Lothar Gutjahr, Denzlingen, Fed. Rep. of Germany, assignor to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,717

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327935

Int. Cl.[4] B29C *45/68*

U.S. Cl. 425—150 **1 Claim**



1. A mold closing unit of an injection molding machine which includes a stationary mold clamping plate and a movable mold clamping plate slidable along parallel guide rods relative to said stationary plate, a movable die affixed to said movable plate, a mating fixed die affixed to said stationary plate and confronting said movable die, the unit comprising a fixed, hydraulic mold closure retention cylinder, and a hydraulic traveling cylinder including a piston operable within said retention cylinder and defining therewith on opposite sides of said piston first and second pressure chambers for respectively retracting and extending said piston, said piston being connected to said movable die, and said piston being hollow so as to define a third pressure chamber, means for operating said unit comprising a hydraulic supply line connected with said first and third chambers, said supply line having a branch line leading to said second chamber, a linear amplifier having rigid hydraulically fixed feedback and comprising a multi-way valve arranged in said supply line for axial movement to control the flow of hydraulic fluid through said supply line and said branch line for closing and opening said movable die, said valve being controllable for the operation of a speed pattern specified for said movable clamping plate, an elongated threaded rotatable spindle threadedly connected with said movable mold clamping plate for axial displacement relative thereto upon rotation of said spindle, said valve being a 4/2-way valve having a valve body on said spindle for axial movement therewith upon spindle rotation, and a stepping motor coupled with said spindle for rotation thereof, said stepping motor being controllable as a function of a predetermined closing speed pattern, whereby rotation of said spindle effects the movement of said 4/2-way valve to control the flow of hydraulic fluid, the movement of said movable die effecting an oppositely directed movement of said valve via said spindle which is counteracted by said motor, and said stepping motor being switchable to an increased number of steps per revolution during mold closing when said movable plate reaches a predetermined distance from said stationary plate for slowing down the mold closing to a specified creep rate before the mold is completely closed so that the mold is closed at said creep rate, independently of the mass of said movable die and of said movable mold clamping plate.

4,592,714

MOLD CLOSING UNIT OF AN INJECTION MOLDING MACHINE

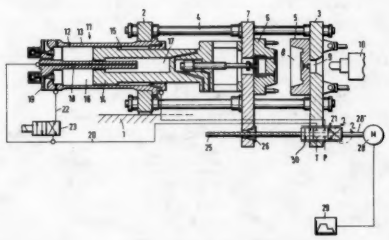
Lothar Gutjahr, Denzlingen, Fed. Rep. of Germany, assignor to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,723

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327937

Int. Cl.[4] B29C *45/68*

U.S. Cl. 425—150 **1 Claim**



1. A mold closing unit of an injection molding machine which includes a stationary mold clamping plate and a movable mold clamping plate slidable along parallel guide rods relative to said stationary plate, a movable mold die affixed to said movable plate, a mating fixed mold die affixed to said stationary plate, the unit comprising a fixed, hydraulic mold closure retention cylinder, and a hydraulic traveling cylinder including a piston operable within said retention cylinder and being connected with said movable die, means for operating said unit comprising a hydraulic supply passage leading to said traveling cylinder and to said retention cylinder for operating said piston, a linear amplifier having hydraulically fixed feedback and comprising a 4/2-way valve arranged in said supply passage for axial movement to control the flow of hydraulic fluid through said passage for closing and opening said movable die, an elongated threaded rotatable spindle extending between said mold clamping plates, a spindle nut on said movable plate through which said spindle extends, a stepping motor connected via a spring coupling with said spindle for rotation thereof, said valve having a valve body on said spindle

for axial movement upon spindle rotation, and said valve having a valve casing surrounding said valve body, said stepping motor being controllable depending on one of a specified speed and pressure pattern as a function of the distance between said movable and fixed or between said mold clamping plates, a stop located in said valve housing at a predetermined axial distance from said valve body, whereby rotation of said spindle effects the movement of said valve body to control the flow of hydraulic fluid, the movement of said movable die effecting an oppositely directed movement of said valve body via said spindle which is counteracted by said motor, and a control or indicator switch arranged in said valve casing at said predetermined axial distance from said coupling, said valve body reacting to a mold closure security error condition, which impedes the closing of the mold, by being shifted a maximum axial distance equal to said predetermined distance against said stop, the shifting of said valve body causing said coupling to shift said maximum distance for activating said switch to control or indicate said condition.

4,592,715

APPARATUS FOR USE IN SHEARING GOBS FROM A VERTICAL COLUMN OF PLASTIC MATERIAL

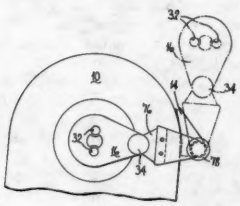
Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 5, 1985, Ser. No. 762,462

Claims priority, application United Kingdom, Aug. 15, 1984, 8420714

Int. Cl.⁴ B29C *17/14;* **B26D** *1/00*

U.S. Cl. 425—308 **13 Claims**



1. Apparatus for use in shearing gobs from a vertical column of plastic material, the apparatus comprising two horizontally-extending blades mounted for turning movement about a common vertical axis, one blade being mounted for sliding movement across the upper surface of the other blade, the blades each having a hole therein so arranged that, when the blades are in a first condition, the holes are aligned and a vertical column of plastic material can pass through the holes, and, upon the blades being turned about the common vertical axis through a predetermined angle, one clockwise and the other anti-clockwise, edges of the holes pass each other until the holes do not overlap and any column of plastic material passing through the holes is sheared through by edges of the holes, the apparatus also comprising turning means on said apparatus operable to turn the blades about the common vertical axis through the predetermined angle, one clockwise and the other anti-clockwise, said turning means comprises a rotary drive motor operable to turn an output shaft, the output shaft being connected to the blades by connecting means which causes the blades to turn in opposite directions about the common vertical axis when the shaft turns in one direction.

4,592,716

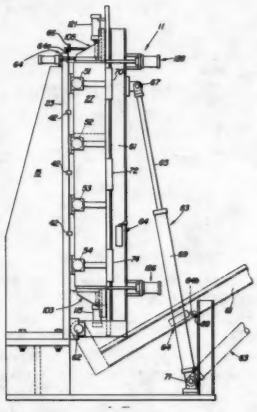
MACHINE FOR MOLDING ELONGATED WORKPIECES

Robert C. Jackson, Cedar Falls, and Patrick M. Luchsinger, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 22, 1981, Ser. No. 305,298

Int. Cl.⁴ B29C *39/04*

U.S. Cl. 425—330 **3 Claims**



1. A machine for molding an elongated workpiece comprising:

a first, elongated, generally vertically oriented quadrant;

a second, elongated, generally vertically oriented quadrant movable toward and away from said first quadrant between a closed and an open position, respectively;

a third, elongated, generally vertically oriented quadrant opposed to said second quadrant and movable toward and away from said first quadrant between a closed and an open position, respectively; and

a fourth, elongated quadrant means pivotably mounted at one end relative to said first quadrant and movable toward and away from said first quadrant between a generally vertically oriented closed position and an inclined, open position, said fourth quadrant means for (a) defining a mold cavity with said first, second and third quadrants when said second and third quadrants and said fourth quadrant means are in the closed position, (b) receiving a workpiece core thereon when in the open position, (c) loading said workpiece core into said mold cavity by movement from the open to the closed position, and (d) unloading a molded workpiece from said cavity by movement from the closed to the open position.

4,592,717

END RETRACT DEVICE FOR COMPLETING SPHERICALLY SHAPED REFLECTIVE FILM

Donn E. Albert, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 4, 1984, Ser. No. 606,921

Int. Cl.⁴ B29C *53/04*

U.S. Cl. 425—400 **8 Claims**

1. In apparatus for forming a reflective surface of a flexible film into a spherically shaped mirror, the combination of:

(a) a frame having longitudinally extending top and bottom walls and opposite end plates joining said top and bottom walls, said walls and end plates having margins presented in a common direction and collectively presenting edges that have a curvature the center of which is common to the collective edges, said curved edges on said end plates having a fixed arcuate length;

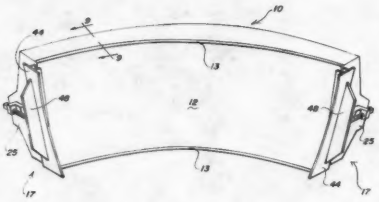
(b) means extending along the curved edges of said top and bottom walls for engaging and retaining certain margins of the flexible film fixed against said curved edges; and

(c) flexible film shaping and holding means cooperating with each of said curved edges on said end plates, each shaping and holding means comprising:

1. a film shaping bracket movable relative to said end plate,

2. a flexible film engaging block means carried by said shaping bracket in position to present the flexible film to said end plate, and

3. positive operating means engaged between said shaping bracket and said end plate for moving said shaping bracket in a direction to force said flexible film engaging block means to conform the chord length of said flexible film to the fixed arcuate length of said end plate curved edge and impart a spherical configuration to the flexible film in the area of the reflective surface adjacent said end plate.



4,592,718

APPARATUS FOR MOLDING HOLLOW PLASTIC ARTICLES

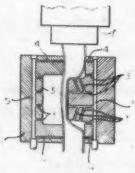
Syoichi Teraoka, 3767-2, Kamura-cho, Fukuyama-shi, Hiroshima-ken, Japan

Continuation of Ser. No. 511,094, Sep. 19, 1983, abandoned, which is a division of Ser. No. 282,704, Jul. 13, 1981, Pat. No. 4,423,000. This application May 1, 1985, Ser. No. 728,452

Claims priority, application Japan, Oct. 17, 1980, 55-145964; Mar. 20, 1981, 56-40995; Mar. 25, 1981, 56-44344

Int. Cl.[4] B28B *21/36*

U.S. Cl. 425—504 **4 Claims**



1. An apparatus for producing a hollow synthetic resin article, which comprises

a split mold having mold cavities with a contour conforming to the configuration of the desired article and consisting of opposing mold members which, when the split mold is open, are designed and constructed to receive in a space between them a heated parison of thermoplastic synthetic resin in the form of a tube or two parallel-laid sheets, said split mold having vacuum suction holes provided in parting surfaces surrounding said cavities, the positions of said latter vacuum suction holes relative to said cavities being determined according to the depth of said cavities,

means for opening and closing said split mold,

means for applying negative pressure to the vacuum suction holes provided in said cavities and the vacuum suction holes provided in said parting surfaces, and

blowing means for blowing heated compressed air while said mold is opened against the inside surface of that portion of the parison which corresponds to said parting surfaces in the direction facing said parting surfaces to facilitate attaching of the parison to said parting surfaces said blowing means being movable to a position outside the space occupied by said split mold when said split mold is closed.

4,592,719

APPARATUS FOR MANUFACTURING PLASTIC BOTTLES FROM MOLDED HOLLOW PREFORMS

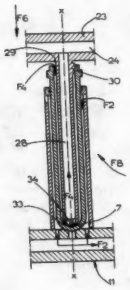
Pierre Bellehache, and Paul La Barre, both of Sainte Adresse, France, assignors to Societe de Machines pour la Transformation des Plastiques, Paris, France

Filed Mar. 18, 1985, Ser. No. 712,497

Claims priority, application France, Mar. 16, 1984, 84 04248

Int. Cl.[4] B29C *49/42*

U.S. Cl. 425—526 **9 Claims**



1. An apparatus for the manufacture of hollow, molded, cylindrical plastic preforms closed at one end, for subsequent expansion to form bottles, characterized by:

(a) separate interior and exterior cylindrical pneumatic suction grips for engaging hot preforms and removing and transporting them away from a mold, said suction grips forming annular chambers with interior and exterior surfaces of the preforms, and

(b) means for circulating air through said chambers to cool the preforms simultaneously with their removal and transportation away from the mold.

4,592,720

DEVICE FOR REHEATING AND BLOW MOLDING PARISONS

Larry M. Dugan, Boulder; Bruce A. Moen, Golden; David E. Rasmussen, Thornton; Christopher S. Derks; Richard L. Szabo, both of Arvada; William C. Carlsen, Wheat Ridge; Robert J. DeRoche, Lakewood, and James W. Ditto, Golden, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Dec. 21, 1984, Ser. No. 684,670

Int. Cl.[4] B29C *49/00, 49/64*

U.S. Cl. 425—526 **17 Claims**

1. A device for reheating and blow molding parisons comprising:

a supporting structure;

core pin means for holding preheated parisons with a minimum transfer of heat from said parisons by thermal conduction, said core pin means having a central opening for applying air to said parisons for blow molding;

core pin holder means having a tapered central opening for holding said core pin means by a nonlocking taper;

means for coupling said core pin holder means to an index-

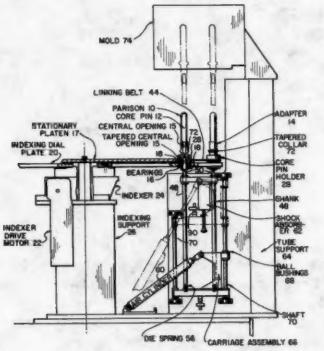
ing dial plate to allow rotation of said core pin holder means in said dial plate;

means for indexing said dial plate in a series of discrete steps to progressive indexing locations;

means for rotating said core pin holder means;

means for radiantly heating said preheated parisons while said parisons are rotating to uniformly heat said preheated parisons to a temperature suitable for blow molding;

tapered shank means which forms a nonlocking taper with said central opening of said core pin means, said tapered shank means having a fluid passage for applying pressurized fluid to said central opening of said core pin means for blow molding;



carriage assembly means for moving said shank means through said central opening of said core pin holder means to remove said core pin means from said core pin holder and to position said core pin means in a blow mold;

preloaded spring means for providing a predetermined force between said tapered shank means and said core pin means independent of pressure applied to said carriage assembly means to seat said tapered shank means in said core pin means and provide an air tight seal;

fluid reservoir means for providing a supply of pressurized fluid for blow molding.

4,592,721

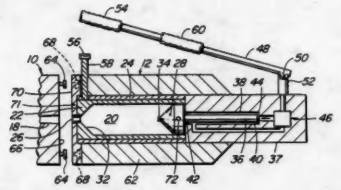
APPARATUS FOR SEALABLY ENCAPSULATING ARTICLES

Leonard J. Charlebois; Renato Mariani, and Fred A. Huszarik, all of Kanata, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 527,759, Aug. 30, 1983, Pat. No. 4,528,150, which is a continuation-in-part of Ser. No. 421,857, Sep. 23, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 660,821

Int. Cl.[4] B29C *45/07*

U.S. Cl. 425—558 **9 Claims**



1. Apparatus for sealably encapsulating an article comprising:

a plastics heating and pressurizing device defining a chamber to contain plastics material and comprising means to heat the material into a molten flowable state and for forcing the molten material from an outlet of the chamber; and a manually portable accumulator defining a reservoir with an inlet;

the heating and pressurizing device and the accumulator having releasable coupling means to assembly them together with the inlet to the reservoir aligned with the outlet from the chamber to interconnect the chamber and reservoir and allow for transfer of molten and flowable plastics material from the chamber to the reservoir;

and the accumulator also having means to retain the plastics material in a molten flowable condition when in the reservoir, and means for forcing the material from the reservoir to fill a mould cavity during a sealing operation, after the accumulator has been manually transferred from the heating and pressurizing device, said forcing means actuable to fill a cavity at a sufficiently fast rate to ensure that, during filling, blocking of the flow passages to the cavity with hardening material does not occur.

4,592,722

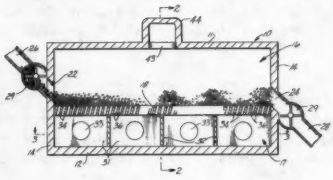
PROCESS AND APPARATUS FOR FORMING LIGHTWEIGHT INORGANIC AGGREGATE

Harold Heckman, Frazier Park, Calif., assignor to Lightweight Processing Co., Glendale, Calif.

Filed Jun. 8, 1984, Ser. No. 618,834

Int. Cl.[4] C04B *20/06*

U.S. Cl. 432—13 **18 Claims**



1. A process for expanding particles of an expandable lightweight inorganic aggregate material comprising:

providing a fluidizing chamber having an inlet end and an outlet end;

introducing non-expanded particles into the inlet end of the fluidizing chamber;

fluidizing the particles with an upwardly flowing stream of hot air having a temperature sufficient to expand the particles for a time sufficient for the particles to expand wherein fluidization of the particles causes the particles to move toward the outlet end of the fluidizing chamber, to thereby provide a particle bed comprising non-expanded particles at the inlet end of the fluidizing chamber and expanded particles at the outlet end of the fluidizing chamber;

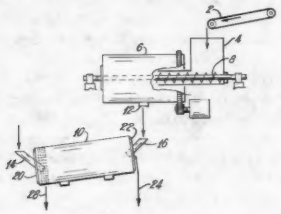
adjusting the flow of the hot air stream so that the velocity of the air fluidizing expanded particles at the outlet end of the chamber is sufficiently less than the velocity of air fluidizing non-expanded particles at the inlet end of the chamber to thereby maintain generally uniform fluidization of the particle bed; and

removing expanded inorganic particles from the outlet end of the chamber.

4,592,723
PROCESS FOR REUSING SCRAP GLASS

Stephen Seng, Bladensburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 24, 1984, Ser. No. 685,630
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.[4] F27B *14/00, 7/02*
U.S. Cl. 432—13 8 Claims



1. A process for producing glass by charging to a melting furnace and melting therein a mixture of particulate glass batch and scrap glass fiber, including the steps of:

heating durable particulate heat transfer media which is larger in particle size than the glass bath with exhaust gases from the melting furnace;

milling the scrap glass fibers in the presence of particulate glass batch to reduce the size of the scrap glass fibers to a usable size, the glass batch containing the scrap glass until it is milled;

introducing the mixture into the other end of the container;

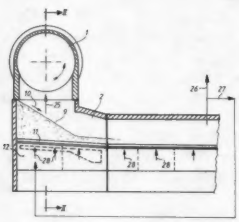
rotating the container, during rotation the mixture and media tumbling and moving over each other in heat transfer relationship for a period of time sufficient to remove any organics from the scrap glass fibers; and

moving the mixture in one direction through the rotating container for discharge and moving the media in the opposite direction for discharge at the other end.

4,592,724
GRATE COOLER AND METHOD OF COOLING

Manfred Dürr, Oelde; Georg Unland; Jürgen Würr, both of Ennigerloh, and Antonius Vering, Ahlen, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,274
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322139
Int. Cl.[4] F27D *15/02*
U.S. Cl. 432—78 9 Claims

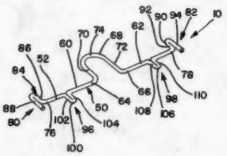


1. A grate cooler adapted to receive material from the discharge end of a rotary kiln arranged at right angles to such cooler, said cooler comprising an elongate thrust grating having a material receiving end below said kiln for receiving material discharged from said kiln, said grating having a vertical plane passing through the longitudinal axis of said grating and spaced from the discharge end of said kiln a distance of between about 10 and 150 cm, said material receiving end having its width divided into a central zone flanked by two lateral zones, said central zone provided with a greater number of stationary grating plates and a greater number of unventilated grating plates than are provided on the lateral zones.

4,592,725
ORTHODONTIC PALATAL ARCH BAR AND METHOD OF USING SAME

Robert A. Goshgarian, 1071 Ash Lawn, Lake Forest, Ill. 60045

Filed Apr. 29, 1985, Ser. No. 728,274
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—7 16 Claims



1. In an orthodontic arch bar appliance for application to the dental upper arch of a person and between opposed molars thereof and comprising a length of spring steel wire defining a pair of spaced oppositely extending body portions integral at like ends with an open U-shaped spring loop adjacent the midportion of the bar that projects laterally of the bar and has its loop leg portions coplanar related, said wire body portions at their respective other ends being doubled over and disposed normally of the respective body portions in substantial coplanar relation to project from the wire in substantially the same direction as the loop and form the wire terminal end portions, the improvement wherein:

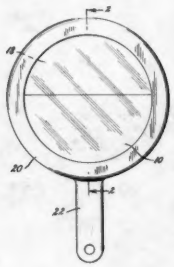
said wire body portions each include a spur located to be spaced from the body portion terminal end portion a distance to be disposed at the level of the centrum of the maxillary molar adjacent it when the bar is operatively applied to and between said molars,

said spurs substantially paralleling said terminal end portions and projecting oppositely thereof.

4,592,726
DIAGNOSTIC MIRROR AND LIGHT FILTER

Herbert Brilliant, 2008 Walnut St., Philadelphia, Pa. 19103

Continuation-in-part of Ser. No. 455,260, Jan. 3, 1983, abandoned. This application Jul. 10, 1984, Ser. No. 629,449
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—31 5 Claims



1. A non-electrified optical handpiece for viewing an area of

the user's body which has been treated with a dye or other material that fluoresces when subjected to appropriately filtered light, whereby the fluorescent material when illuminated improves differentiation between diseased and healthy portions of said area, said optical handpiece consisting essentially of:

(a) a single unitary substantially uni-planar optical member having a surface of which a portion is at least partially mirrored so as to be capable of reflecting light from a source remote from said handpiece, and another portion of which is at least partially transparent so as to be capable of transmitting said light, and

(b) a light filtering material covering at least a portion of said optical member's transparent portion for filtering said light and providing a filtered light sufficient to fluoresce said fluorescent material.

4,592,727

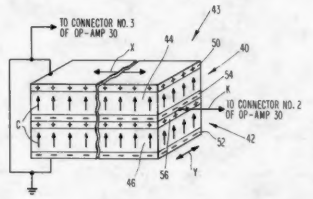
PIEZOELECTRIC POLYMERIC FILM DISCRIMINATING BITE FORCE OCCLUSAL INDICATOR

Philip E. Bloomfield, Bala Cynwyd, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 24, 1984, Ser. No. 613,687

Int. Cl.[4] A61C *9/00*

U.S. Cl. 433—71 **3 Claims**



1. Bite force occlusal indicating device comprising

piezopolymer film means having a metallized coating on each face thereof to form a piezoelectric film assembly, said polymer film means including mechanically uniaxially oriented dipole crystallites therein, each of said coatings exhibiting opposite polarity, two of said piezoelectric film assemblies being secured in superposed face-to-face metallized coating contact relationship to form a stacked piezofilm assembly,

electrical means connected to said stacked piezofilm assembly for conducting electrical output generated thereby, said output being generated when bite force is applied to said stacked piezofilm assembly,

each of said uniaxially oriented polymer film means including a mechanical orientation axis substantially parallel with direction of length of said film means, said film means being disposed in superposed relationship at substantially right angles to each other,

said metallized coatings in face-to-face contact relationship being of opposite polarity and remaining coatings being grounded,

said dipole crystallites of each polymer film means being similarly electrically oriented,

a non-permanently or permanently disposable and reusable material coating in contact with outer faces and edges of said stacked piezofilm assembly,

said stacked piezofilm assembly providing an insensitive pure compression bite force indicating device and a sensitive sliding bite force indicating device when said bite force is applied to said non-permanent or permanent material coating of said stacked piezofilm assembly.

4,592,728

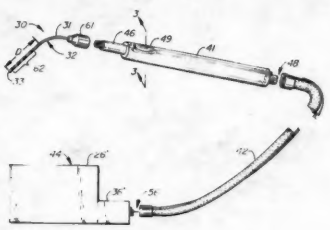
PERIODONTAL LAVAGE DELIVERY SYSTEM

Dennis R. Davis, 700 Moraga St., San Francisco, Calif. 94122

Continuation of Ser. No. 328,000, Dec. 7, 1981, abandoned. This application Apr. 30, 1984, Ser. No. 604,608

Int. Cl.[4] A61M *5/00*

U.S. Cl. 433—80 **1 Claim**



1. Apparatus for use in therapeutic lavage of periodontal pockets comprising:

a generally cylindrical grip member;

a delivery tip comprising a base portion and a capillary tube fixed at the proximal end thereof to said base portion, said base portion being detachably mounted to said grip member, said capillary tube being formed of stainless steel of 25 to 30 gauge having a central bore opening directly into the distal end of said delivery tip, and having an elbow defining an obtuse angle in the range of 120 to 150 degrees at a predetermined distance of at least 10 mm from said distal end to facilitate insertion of said tube into a periodontal pocket, said capillary tube being further provided with indicia, in the form of alternately colored bands around said capillary tube, of the distance from said distal end;

a base unit containing reservoir means for holding a therapeutic lavage fluid;

electric pump means for actuating flow from said reservoir means;

duct means in flow communication with said delivery tip and said reservoir means; and

touch-sensitive switch means positioned on said grip member to be actuated by finger or thumb pressure when the grip member is grasped for use, said switch means being connection to actuate said electric pump means thereby producing a controlled flow of therapeutic lavage fluid from said reservoir means through said delivery tip for delivery to the depths of a periodontal pocket.

4,592,729

STRIP-HOLDER FOR INTERDENTAL THERAPY

Andrei S. Bilciurescu, Kaiserplatz 14, 53 Bonn-1, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,753

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414192

Int. Cl.[4] A61C *3/06*

U.S. Cl. 433—142 **12 Claims**

1. A strip-holder for interdental therapy comprising a handle, a steel-bow, a tape-like steel-strip, and a quick-tensing and gripping-device providing grip-openings at opposite ends of said steel-bow for fixing and tensing the tape-like steel-strip over an outwardly facing opening of the steel-bow, wherein:

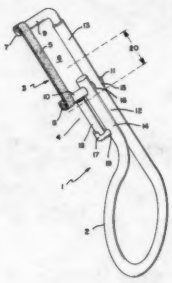
said steel-bow is substantially flat, approximately U-shaped, and made of drawn-rod material;

said grip-openings are cut in said steel-bow ends so as to provide grip-slots having only a slightly greater width than the thickness of the tape-like steel- strip;

said handle is attached to a portion of said steel-bow and extends outside the bow itself, this bow portion adjoining the handle being part of the quick-tensing and gripping-

device for the tape-like steel strip and comprising an internal bow-end having a turning and locking-peg which is pivotally attached to a frame-piece of the U-shaped steel-bow and is perpendicular to said frame-piece;

a prolongation-piece is attached to said frame-piece of the U-shaped steel-bow and is extended so as to form the handle of the strip-holder;



said handle is made of the material of the steel-bow and, in the shape of a loop, is brought to the beginning of the frame-piece of the U-shaped steel-bow, where it forms a segment for the reinforcement of said prolongation-piece attached to said frame-piece of the U-shaped steel-bow; and,

said turning and locking-peg is placed through bore-holes made in two parallel-running rod-pieces forming said reinforcement-segment.

4,592,730

RIFLE TRAINING APPARATUS

Lindsay C. Knight, Albury, and Brian Compton, Lavington, both of Australia, assignors to Lomah Electronic Targetry, Inc., Boca Raton, Fla.

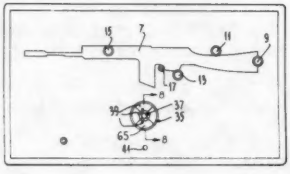
Continuation of Ser. No. 835,431, Sep. 21, 1977, Pat. No. 4,457,715, which is a continuation-in-part of Ser. No. 733,331, Oct. 18, 1976, abandoned, which is a continuation of Ser. No. 617,145, Sep. 26, 1975, abandoned. This application Jul. 2, 1984, Ser. No. 626,921

Claims priority, application Australia, Jul. 10, 1975, 82919/75

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] F41F *27/00;* **F41G** *3/26;* **G09B** *19/00*

U.S. Cl. 434—22 **51 Claims**



1. Apparatus for training in the use of a firearm, comprising:

a training firearm;

at least one transducer means positioned relative to the firearm and coupled for providing a signal representing pressure applied to the training firearm;

a circuit means responsive to said transducer signal for defining a transducer signal range corresponding to a predetermined optimal range of pressure applied to the firearm; and

an indicator means responsive to said circuit means for providing an indication when the pressure applied to the firearm at said transducer means is within said predetermined optimal range.

4,592,731

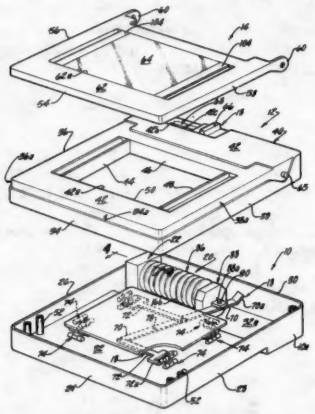
TEACHING APPARATUS

David C. Shifflett, Mt. Clemens; Daniel J. Shifflett, Roseville, and Dennis I. Shifflett, Mt. Clemens, all of Mich., assignors to Al-Ko Products, Inc., Fraser, Mich.

Filed Mar. 18, 1985, Ser. No. 712,517

Int. Cl.[4] G09B *17/00*

U.S. Cl. 434—184 **17 Claims**



1. In a teaching apparatus of the type comprising a housing having a window in the top wall thereof, a platen positioned within the housing and movable between a raised position immediately beneath the window and a lowered position spaced below the window, and means for moving the platen between its raised and lowered positions, the improvement wherein said moving means includes:

A. a bellows moved to a collapsed position in response to movement of said platen to its raised position and operative when extended to move said platen to its lowered position; and

B. valve means selectively controlling the rate at which air is allowed to move back into said collapsed bellows to thereby control the rate of extension of said bellows and the rate at which said platen returns to said lowered position.

4,592,732

MARINE PROPULSION DEVICE POWER STEERING SYSTEM

Arthur R. Ferguson, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

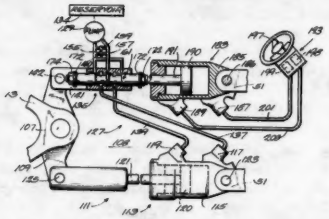
Continuation-in-part of Ser. No. 605,141, Apr. 30, 1984, Pat. No. 4,545,770, which is a continuation of Ser. No. 293,324, Aug. 17, 1981, Pat. No. 4,449,945. This application May 29, 1984, Ser. No. 614,815

Int. Cl.[4] B63H *21/26*

U.S. Cl. 440—61 **25 Claims**

1. A marine propulsion device adapted for mounting to a boat transom and comprising a propulsion unit, means connecting said propulsion unit to the boat transom for pivotal movement of said propulsion unit relative to the boat transom about a steering axis, and means for rotating said propulsion unit about said steering axis, said means including an extendible and contractable steering link pivotally connected to the boat transom and to said propulsion unit, and means for selectively extending and contracting said steering link, said means includ-

ing operator actuated extendible and contractable control means connected to the boat transom and to said propulsion



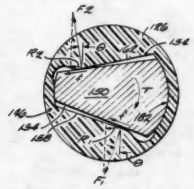
unit and operably connected to said steering link for selectively effecting extension and contraction of said steering link in response to operator actuation of said control means.

4,592,733

WATER PUMP FOR MARINE PROPULSION DEVICES

Gerald F. Bland, Glenview, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 12, 1983, Ser. No. 560,593
Int. Cl.[4] B63H *21/38*
U.S. Cl. 440—88 **12 Claims**



1. A marine propulsion device comprising an engine with a cooling jacket, and a fluid pump assembly for circulating water through said cooling jacket, said fluid pump assembly comprising a housing including a pump chamber, a drive shaft extending into said pump chamber, means for rotating said drive shaft, an impeller within said housing, and interengaging wedge-shaped means on said drive shaft and on said impeller defining first and second lines of engagement extending between said impeller and said drive shaft in parallel relation to the axis of drive shaft rotation, which lines of engagement produce forces effective to locate said drive shaft and said impeller in a single driving relation to each other, said wedge-shaped means including first and second convergent side walls on said shaft and in respective driving engagement with said impeller solely along said first and second lines of engagement.

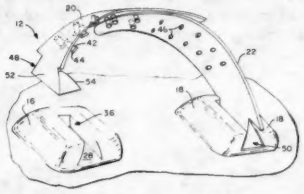
4,592,734

FOOT STRAP AND BASEPLATE ASSEMBLY

Richard Metiver, 935 Metivers Way, Watsonville, Calif. 95076

Filed May 31, 1985, Ser. No. 739,522
Int. Cl.[4] B63B *35/72*
U.S. Cl. 441—74 **7 Claims**

1. A foot strap and baseplate assembly for use on boards for surfboarding and windsurfing sports comprising the combination of a pair of baseplates for mounting in spaced-apart relationship on the surface of the board, each baseplate comprising a body having a top, front and rear ends and a flat bottom for securing to the surface of the boards, means forming a cavity in each baseplate, the cavity having an internal bottom wall and opposing side walls which converge upwardly at an acute angle and open through the top along a slot, the cavity being open at the rear end through a wedge-shaped doorway and being closed at the opposite end by the front end of the body, a pair of elongated flexible straps, means for detachably securing the distal ends of the straps together, each strap being formed with an enlarged proximal end of an elastomer having a predetermined hardness which enables the proximal end to remain engaged in the cavity when the pulling force on the



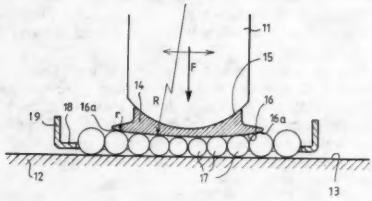
strap is below a predetermined limit, the proximal end resiliently deforming to disengage from the cavity when the pulling force on the strap at that proximal end exceeds the predetermined limit whereby the strap is released from the baseplate to free the user's feet from the board.

4,592,735

ARRANGEMENT OF TWO ELEMENTS WHICH UNDERGO ALTERNATING RELATIVE MOTION AND ITS APPLICATION OF SLIDABLE HOMOKINETIC JOINTS

Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Oct. 23, 1984, Ser. No. 664,073
Claims priority, application France, Nov. 4, 1983, 83 17576
Int. Cl.[4] F16D *3/06, 3/20*
U.S. Cl. 464—111 **8 Claims**



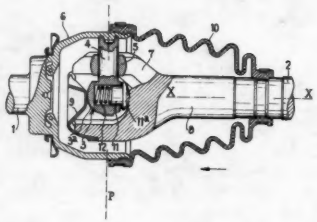
1. An assembly comprising two elements which undergo a motion with respect to each other, a row of aligned and adjacent rolling members interposed between and in rolling engagement with said elements, a cage maintaining the rolling members in position, and means for returning the cage to a given position relative to a first of said elements, said means comprising an arrangement in which said rolling members have respective diameters which progressively increase from rolling member to rolling member from a centre of said row of rolling members in a direction toward end rolling members of said row, said first element having a convex rolling surface which is such as to rollingly engage substantially all of said rolling members.

4,592,736

TRIPOD CONSTANT-SPEED JOINT, IN PARTICULAR FOR THE TRANSMISSION OF A MOTOR VEHICLE

Jacques Mangiavacchi, Chatou, France, assignor to Glaenzer Spicer, Poissy, France

Continuation of Ser. No. 561,208, Dec. 14, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,612
Claims priority, application France, Dec. 22, 1982, 82 21553
Int. Cl.[4] F16D *3/20*
U.S. Cl. 464—111 3 Claims



1. A tripod constant-speed joint, in particular for a motor-vehicle transmission, said joint comprising:

a tripod element for connection to a first shaft and having three trunnions;

spherical rollers rotatively and slidably mounted on said trunnions;

a tulip element for connection to a second shaft and defining runways;

said rollers being engaged in said runways;

means defining first and second spherical bearing surfaces carried by said tulip element, said spherical bearing surfaces having in central zones thereof respective concave cavities defining lunules;

said tripod element having a first spherical dome;

a mushroom element slidably mounted in a hub of said tripod element and defining a second spherical dome;

said tripod element being retained in said tulip element with said first and second spherical domes bearing against said first and second spherical bearing surfaces, respectively;

said lunules having radii of curvature substantially greater than radii of curvature of respective said spherical domes;

said radii of curvature of both said spherical domes being defined by respective centers of curvature, each said center of curvature being offset toward the respective said spherical dome relative to a median axial plane of said tripod element which is perpendicular to the axis of said tulip element; and

packing means, positioned between said mushroom element and said hub of said tripod element, for creating an axial load urging said spherical domes away from each other toward respective said spherical bearing surfaces and for preventing said center of curvature of said second spherical dome from moving to said median axial plane.

4,592,737

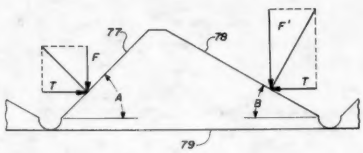
TORQUE SENSING DRIVE

André G. J. Dhont, Maldegem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 391,763, Jun. 24, 1982, abandoned. This application May 23, 1985, Ser. No. 738,819
Int. Cl.[4] F16H *9/18, 11/06*
U.S. Cl. 474—19 6 Claims

1. In a torque sensing variable diameter power transfer assembly having a fixed sheave half connected to a power transmitting shaft and rotatable therewith; a movable sheave half co-axially mounted on said power transmitting shaft and slidably movable along the axis of said shaft relative to said fixed sheave half; a first cam member co-axially mounted on said power transmitting shaft and rotatable with said movable sheave half, a second cam member co-axially mounted on said power transmitting shaft and rotatable with said movable sheave half, said first cam member being in axially shiftable torque transmitting engagement with said second cam member, each said cam member having a cam surface engageable with the cam surface on the other of said cam members to transmit torque therebetween; and spring means mounted between said first and second cam members to axially urge said cam members away from one another, the improvement comprising:

an asymmetrical cam surface pattern on each of said cam members, each said cam member having a first cam surface and an opposing second cam surface, the corresponding said first cam surfaces engaging under conditions where said second cam member is transmitting torque to



said first cam member, the corresponding said second cam surfaces engaging under conditions where said first cam member is transmitting torque to said second cam member, said first and second cam surfaces providing different amounts of axial movement per given amount of relative rotational movement therebetween, said cam members exerting a greater axial force for a given tangential force on said cam surfaces when said second cam surfaces are engaged than when said first cam surfaces are engaged, permitting the transmission of a full range of power through said power transfer assembly with a constant tension ratio in a drive member drivingly engaged with said fixed and movable sheave halves irrespective of which cam member is transmitting torque to the other said cam member.

4,592,738

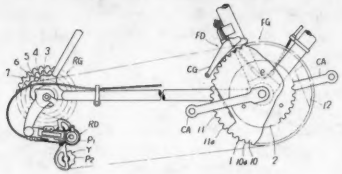
CHAIN GEAR FOR A BICYCLE

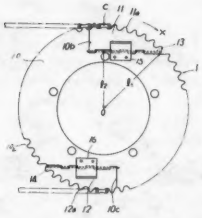
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 23, 1984, Ser. No. 633,440
Claims priority, application Japan, Jul. 22, 1983, 58-134921
Int. Cl.[4] F16H *11/08*
U.S. Cl. 474—80 2 Claims

1. A chain gear for a bicycle which includes a derailleur for shifting a driving chain from one gear to another of a multi-stage chain gear assembly, said chain gear comprising a gear body having a plurality of teeth, at least one partial gear having a plurality of teeth, and hinge means disposed between said partial gear and said body for pivotably connecting said partial gear with respect to said gear body such that said partial gear is shiftable axially relative to said multi-stage chain gear assembly, said partial gear and said gear body together forming a complete chain gear in which said teeth of said partial gear and said gear body are disposed in a same plane, said partial gear being connected to said gear body such that said partial gear when rotating as a complete chain gear with said gear body is shifted less at a front side of said partial gear defined relative to a drive rotation direction of the complete chain gear than at a rear side of said partial gear defined relative to said drive rotation direction, said gear body including elastic means for positioning said partial gear in a neutral position in a same plane as said gear body, said partial gear being caused to shift axially, responsive to said derailleur contacting said chain to move said chain axially of said multi-stage chain gear assembly,

to thereby cause the chain which is in engagement with the partial gear to be switched to another chain gear of the multi-





stage chain gear assembly while maintaining the engagement of the chain with the partial gear.

4,592,739

WEB MATERIAL FOLDING DEVICE

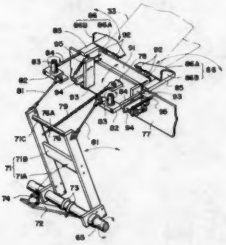
Kenji Ogawa, Musashino, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1983, Ser. No. 456,228

Claims priority, application Japan, Jan. 20, 1982, 57-7125; Jan. 25, 1982, 57-9788

Int. Cl.[4] B31B *27/14, 27/26*

U.S. Cl. 493—415 **15 Claims**



1. A folding device for an elongated continuous strip of plastic web material having an elongate cut formed therein at regular intervals in the longitudinal direction thereof, comprising:

frame means;

a pair of spaced end receiving members mounted on said frame means;

means defining a pathway for said web material on said frame means;

reciprocal feed means on said frame means for feeding said continuous strip of plastic web material in a zigzag manner so that web material sections are stacked one on top of the other between folded end portions thereon, said folded end portions thereon being oriented adjacent said folded end receiving members, said feed means reciprocating between said pair of spaced folded end receiving members;

folded end holding members and drive means for supporting and driving said folded end holding members for movement toward and away from said folded end receiving members along at least one lateral edge of said pathway for said web material, said drive means causing, when said folded end holding members are moved away from said folded end receiving members, said folded end holding members to move out of a previously folded end of said web material to allow passage of said feed more, said drive means causing, when said folded end holding members are moved toward said folded end receiving members, said folded end holding members to move into a location for guiding therearound said web material fed by said feed mechanism and effecting a tight clamping of said web material between said folded end holding means and said folded end receiving members; and

a stacking means under said feed means having a receiving bed, onto which said folded web material is successively piled up, said receiving bed having at least one bar-like insertion member projecting therefrom and received in said linear cut formed in said web material.

4,592,740

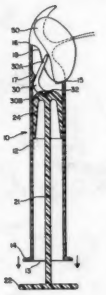
VAGINAL SPONGE APPLICATOR

Nimetullah M. T. Mahruki, Ortaköy, Palanga cad. Süreyya Bey Apt., Istanbul, Turkey

Filed Dec. 4, 1984, Ser. No. 678,062

Int. Cl.[4] A61F *13/20*

U.S. Cl. 604—15 **14 Claims**



1. A reusable applicator adapted to insert a vaginal sponge directly against a woman's cervix, said applicator comprising:

an outer barrel having an open upper end for receiving and delivering a vaginal sponge directly against a woman's cervix;

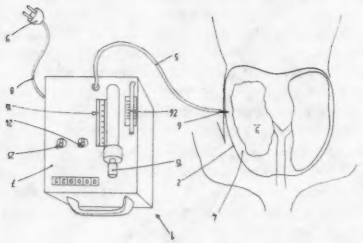
piston means contained within said outer barrel, said piston means including gripping means at one end thereof external of said barrel and a piston head at the opposite end thereof internal within said barrel, said piston head adapted to travel within said barrel toward and away from said open upper end; and

ejector means pivotably mounted on said piston head, said ejector means adapted to force said vaginal sponge out of said barrel through said open upper end and deliver said sponge directly against a woman's cervix at an angle relative to said applicator as the piston head travels toward the open upper end of the barrel.

4,592,741
MEDICAL APPARATUS DESIGNED FOR THE ASPIRATION OF PHNEUMOTHORAX

Michel J. Vincent, 47 rue Tronchet, Lyon 6eme - Rhone, France

Filed Jun. 12, 1984, Ser. No. 619,876
Int. Cl.[4] A61M *1/04*
U.S. Cl. 604—35 12 Claims



1. A device for the aspiration of a pneumothorax through a hollow needle inserted between the ribs of a patient comprising:

hollow needle means for insertion between the ribs of a patient

a hose connected to said hollow needle means for flow communication therebetween;

means for suction of a gas from said pneumothorax, said means for suction connected to said hose for flow communication therebetween;

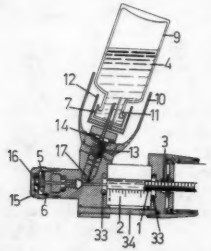
means for sensing the flow rate of said gas drawn from said pneumothorax by said means for suction and for generating an electrical signal which is proportional to said gas flow rate, said means for sensing mounted in said hose between said needle means and said means for suction; and

electronic control means responsive to said electrical signal from said means for sensing for calculating and displaying a total volume of gas that has flowed through said hose.

4,592,742
PRESSURE HYPODERMIC SYRINGE

Sergio Landau, Av. Epitácio Pessoa, no. 2870/202, Lagoa-Rio de Janeiro, Brazil (CEP.22471)

Filed Mar. 7, 1985, Ser. No. 709,127
Claims priority, application Brazil, Aug. 28, 1984, 8404286
Int. Cl.[4] A61M *5/30*
U.S. Cl. 604—71 9 Claims

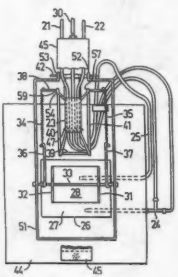


1. A pressure hypodermic syringe for jet injection of variable doses of liquid medication in the intradermal, subcutaneous or intramuscular tissues of persons or animals, characterized by having a nozzle containing a minute front orifice through which the medication dose is expelled in jet form, an injection piston displaceable forward and backward respectively for aspiration and injection of the medication dose, a transparent graded cylinder to hold the desired dose each time and which can withstand the internal pressure generated as the piston presses the liquid toward the front orifice, sealing rings at both ends of said cylinder to prevent leakage of said liquid, said nozzle and front orifice forming a forward unit, said piston and spring comprising elements of a back unit, and one each of said sealing rings respectively tightly secured between the ends of said cylinder and said forward and back units, a spring which is depressed at a given pressure before each aspiration, and decompressed in a single movement, causing the piston to be promptly impelled forward to inject the medication dose through the front orifice, a screw which, when turned forward, causes the spring to compress, and when turned backward becomes coupled to the back end of the piston, pulling it backward and causing aspiration of the medication dose into the transparent graded cylinder, and a shot button that when activated uncouples the back end of the piston from the screw, causing sudden decompression of the spring which in turn forces the piston to impel the medication dose toward the front orifice, such that the syringe comprising all the above components can simultaneously inject variable doses of the medication dispensed in jet form, while allowing for visual dose adjustment at each aspiration through the changing of the position of the forward face of the piston as it is displaced inside the transparent graded cylinder, thereby allowing the user to visualize at once and each time the entire graded scale, the entire medication dose inside the cylinder, and the front end of the piston.

4,592,743
APPARATUS FOR MIXING LIQUIDS

Birger T. Hjertman, Vällingby, and Percy E. Bennwik, Saltsjö-Boo, both of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

PCT No. PCT/SE84/00185, § 371 Date Jan. 10, 1985, § 102(e) Date Jan. 10, 1985, PCT Pub. No. WO84/04461, PCT Pub. Date Nov. 22, 1984
PCT Filed May 16, 1984, Ser. No. 694,829
Claims priority, application Sweden, May 18, 1983, 8302796
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—82 6 Claims



1. A device for dosing and mixing two or more liquids and comprising

(a) a supply container for each of the starting liquids to be mixed, and liquid lines (21, 22) from each of these containers;

(b) a chamber (26), in which the liquid lines (21, 22) from the supply containers end, the chamber having a variable volume and variations of this volume being sensed by a sensor (28);

(c) an outlet line (30) for a liquid mixture from the chamber (26);

(d) valve means (47, 48) for opening and interrupting a liquid flow in the inlet lines (21, 22) from the supply containers and in the outlet line (30) from the chamber (26); and

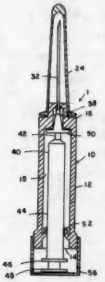
(e) connection means (23) between the valve means (47) in the supply lines (21, 22) for the starting liquids and the valve means (48) in the outlet line (30) for the liquid mixture which causes either the supply (21, 22) to be open and the outlet line (30) to be closed, or the supply lines (21, 22) to be closed and the outlet line (30) to be open, or which causes the supply lines (101) to open and close while the outlet line (107) remains open, said connection means (23) being controlled to shift between its two states by the sensor (28) for variations of the volume of the chamber (26), characterized in that the connection means (23) consists of a mechanical, bistable flip-flop device, which in one of its stable positions closes the supply lines (21, 22) and opens the outlet line (30), and in its other stable position opens the supply lines (21, 22) and closes the outlet line (30), or which in one of its stable positions closes the supply lines (101) and in its other stable position opens the supply lines, (101) while the outlet line (107) remains open, and closes the outlet lines (107) when the supply of starting liquids is essentially exhausted, said flip-flop device being made to shift between its two stable positions by mechanical actuation from said sensor (28).

4,592,744

SELF-RESHEATHING NEEDLE ASSEMBLY

Janine C. Jagger; Richard D. Pearson; Patrice G. Guyenet, all of Charlottesville, and Jessica J. Brand, Earlysville, all of Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Aug. 14, 1985, Ser. No. 765,397
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **30 Claims**



1. A disposable medical needle apparatus comprising a case having an elongated cavity surrounded by a longitudinally extending wall, the cavity having a first relatively open end at a first longitudinal end of the wall and having a second relatively closed end at a second opposite longitudinal end of the wall, the case having a needle-passing restricted opening in the second end, and the case having an inward extension near the first end for preventing passage of a needle assembly past the inward extension and holding a needle assembly within the cavity, wherby a needle assembly, after use, may be withdrawn from the opening and may be held within the cavity.

4,592,745

DISPENSER

Jorn Rex, Roskilde, and Otto A. Vogeley, Herlev, both of Denmark, assignors to Novo Industri A/S, Denmark

Filed Feb. 29, 1984, Ser. No. 584,876
Int. Cl.[4] A61M *5/22*
U.S. Cl. 604—211 **10 Claims**

1. A dispenser device for dispensing predetermined successive quantities of fluid through a needle which comprises an elongated body adapted for placement of a double-pointed hollow needle at one end thereof;

said elongated body further comprising separable top and bottom longitudinal sections secured together, the bottom section having a reservoir region adapted to contain therein a prefilled reservoir to serve as fluid reservoir for dispensing the fluid therefrom;

a needle placement locale on the bottom section whereby a double-pointed hollow needle situated thereon would extend into the region for the prefilled reservoir and into the fluid of any reservoir in said region;

the top section containing the dispensing mechanism of:

a non-rotatable pressure responsive means element adapted to be pushed longitudinally inward from outside of said body, advancing same longitudinally in said body; a sta-

tionary rotatable screw operatively connected to said pressure responsive means element and rotated by advancing movement of said element; a stationary rotatable piston rod nut operatively connected to said rotatable screw and rotated by said rotatable screw and a non-rotatable piston rod threaded to said piston rod nut and advanced by rotation of said piston rod nut;

spring means adapted to cause said pressure responsive means element to retract when pushing pressure thereon ceases; and means adjacent the connection between said screw and said piston rod nut for preventing reverse rotation of said screw during retraction movement of said element;

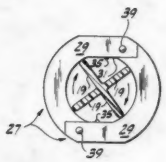
said piston rod extending into the region for the prefilled reservoir whereby advancing movement of said piston rod could expel fluid from a reservoir in said region.

4,592,746

SYRINGE AND LOCKING DEVICE AND METHOD OF ASSEMBLING SAME

Richard A. Burkholder, St. Charles; Richard W. Gilson, St. Louis, and Clarence L. Walker, Webster Groves, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 10, 1985, Ser. No. 743,126
Int. Cl.[4] A61M *5/315*
U.S. Cl. 604—220 **7 Claims**



1. In a locking device for attachment to the exterior of a syringe barrel, comprising:

a generally flat body;

means adapted to fit exteriorly of the syringe barrel for holding the device against rotation when in use on a syringe barrel;

a generally circular opening in the body for passage of a syringe plunger reciprocatably therethrough;

at least two ridges extending chordally across the generally circular opening, said ridges being spaced from each other a distance less than the diameter of the generally circular

opening and said ridges having a thickness that is less than the thickness of the body; and

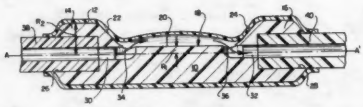
the improvement wherein said body is constructed of two discrete, identical and separate halves adapted to be fixedly connected to each other and to the exterior of the syringe barrel.

4,592,747

FLUID FLOW SENSOR

Scott L. Pool, Santa Ana, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jun. 18, 1984, Ser. No. 621,573
Int. Cl.[4] A61M *5/005*
U.S. Cl. 604—246 **14 Claims**



1. A fluid flow sensor comprising:

a body having an input end and an output end with a recessed surface located therebetween, said body further including a first internal passage between said input end and said recessed surface, and a second internal passage between said output end and said recessed surface;

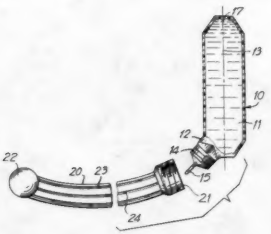
a flexible cover that is secured to said body, said flexible cover being movable between a contracted position and an expanded position in response to fluid flow through said first and second internal passages, said flexible cover contacting the recessed surface in said contacted position and being spaced apart from the recessed surface in said expanded position.

4,592,748

YOGHURT BASED DOUCHE KIT AND ASSEMBLY THEREFOR

Leonora Jost, New York, N.Y., assignor to Vortex Research Corp., New York, N.Y.

Filed May 18, 1984, Ser. No. 612,065
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—279 **6 Claims**



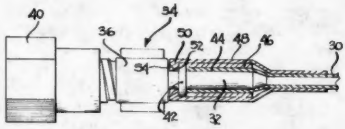
1. A lyophilized yoghurt product for use, in an aqueous dispersion, as a vaginal or anal douche, said yoghurt product being produced by a method which comprises adding to bovine milk pure, cultured *Lactobacillus acidophilus, Lactobacillus helveticus* and *Streptococcus lactis,* each in an amount of 0.1 g per liter of milk, culturing the resulting mixture at about 78°–80° F. for a period of time sufficient to cause coagulation and thereby form a yoghurt and lyophilizing the resulting yoghurt to form a dry powdered product.

4,592,749

CATHETER SYSTEM

Wendell V. Ebling, Placentia, Calif., and James H. DeVries, Grand Rapids, Mich., assignors to Gish Biomedical, Inc., Santa Ana, Calif.

Filed Jun. 22, 1984, Ser. No. 623,110
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—283 **14 Claims**



1. A system for connecting a catheter tube to a fitting with a fluid tight seal, said system comprising:

(a) a flexible and somewhat stretchable catheter tube having an outer wall with an interior bore and formed of a silicone rubber such that the wall is compressable to a substantially lesser thickness,

(b) a plastic fitting formed of a thermoplastic material and having an elongate cylindrically shaped stem wherein the outer surface consists of a smooth outer surface with no substantial irregularities therein and sized to fit into the bore of the silicone rubber catheter tube in relatively fluid tight engagement therewith,

(c) an enlarged shoulder on an end of said stem and adapted to be engaged by an end of the catheter tubing, said shoulder having a forward surface facing said tube and a rearward surface facing away from said tube,

(d) a relatively rigid sleeve sized to fit over the portion of the catheter tube overlying the elongate stem and engaging the forward surface of said shoulder, said sleeve tightly engaging the exterior surface of the tube and compressing same against the stem to insure a relatively fluid tight seal between the fitting and tube and

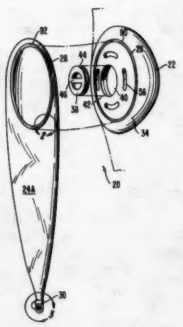
(e) a boot sized to extend over the relatively rigid sleeve and a portion of the tube not covered by said sleeve and to extend over said shoulder and engage the rearward surface of said shoulder.

4,592,750

OSTOMY APPLIANCE

Dennis M. Kay, 236 Mariner Dr., Tarpon Springs, Fla. 33589

Filed Oct. 26, 1984, Ser. No. 665,449
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—337 **36 Claims**



1. An ostomy appliance comprising:

a faceplate having an inner surface, an opposite outer surface, and an opening engaging said inner surface,

said faceplate being adapted to be placed so that said inner surface is generally against the body of a user and said opening registers with the stoma of the user,

said faceplate including an outflow channel means communicating with said opening and engaging said outer surface for allowing the outflow of stoma waste products from the stoma through said faceplate,

said faceplate further including a stoma protector shield having an inner shield surface adapted to face the user and an outer shield surface, said inner shield surface being positioned over said opening and spaced a small distance from said inner surface away from the user whereby a chamber is defined adjacent the stoma.

said outflow channel means communicating with said chamber, and

said protector shield being adapted to protect the stoma when an object impacts said faceplate at a location directly over the stoma.

4,592,751

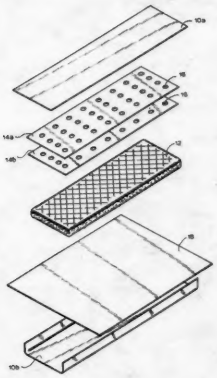
INCONTINENCE PAD

Anthony A. Gegelys, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 515,023, Jul. 18, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,264

Int. Cl.[4] A41B *13/02;* A61F *13/16*

U.S. Cl. 604—368 **25 Claims**



1. An incontinence pad comprising a cover sheet having a moisture permeable section and a moisture impermeable section, a layer of moisture absorbent core material situated within said cover sheet and a uni-directional moisture barrier means interposed between said permeable cover section and said absorbent core layer, said barrier means being of substantially uniform thickness and comprising a laminate containing a super absorbent polymer that expands when wetted, said barrier means having a plurality of apertures extending therethrough, said apertures having a given diameter prior to the expansion of said polymer to facilitate the passage of liquid through said barrier means to said absorbent core layer, the diameter of said apertures decreasing as said polymer expands so as to restrict the passage of liquid back through said barrier layer towards said permeable cover section.

4,592,752

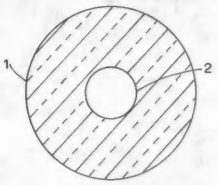
NON-OPTICAL CORNEAL DRUG DELIVERY

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Filed Aug. 2, 1985, Ser. No. 762,147

Int. Cl.[4] A61K *9/22*

U.S. Cl. 604—895 **25 Claims**



1. A non-optical corneal drug delivery device that releases a drug contained in the corneal drug delivery device at a predetermined rate and is substantially the size and curvature of the cornea upon which it is placed and has a central visual aperture substantially the size of the pupil and positioned on the cornea around the pupil of the eye, the convex surface is tapered to form a thin flexible outer peripheral edge, the convex surface is also tapered to form a thin flexible inner edge surrounding the central pupil aperture, whereby both the inner central pupil aperture edge and the outer peripheral edge are flexible and conform to the shape of the cornea on which the corneal drug delivery device is applied.

4,592,753

DRUG DELIVERY DEVICE

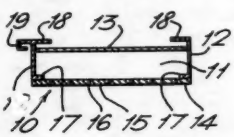
Donald E. Panoz, Southhampton, Bermuda, assignor to Elan Corporation P.L.C., Athlone, Ireland

Filed Nov. 28, 1983, Ser. No. 555,577

Claims priority, application Ireland, Dec. 13, 1982, 2962/82

Int. Cl.[4] A61M *7/00*

U.S. Cl. 604—897 **6 Claims**



1. A device for the transdermal administration of a drug to a patient, said device comprising a reservoir for the drug to be administered, said drug being associated in the reservoir with a pharmaceutically compatible ointment, cream or jelly-like carrier, said reservoir being largely impermeable to the drug and having a defined passage means through which the drug is supplied to the skin, said defined passage means comprising a drug permeable wall member, providing a face of the reservoir, said drug permeable wall member having a first surface forming part of the reservoir and a second, opposite, surface of a defined area for contacting the skin whereby the device positively conveys the drug in the direction of the skin at a predetermined rate, means for removably attaching the reservoir to a support member, said support member being engageable with a face of the reservoir remote from that face formed by said wall member, wherein the face of the reservoir remote from that face formed by said wall member comprises a plate movable in piston-like fashion towards said wall member, the device further including a spring acting against said movable plate to cause a constant egress of ointment, cream or jelly-like carrier from the reservoir to the skin through said wall member, said support member in use substantially surrounding and

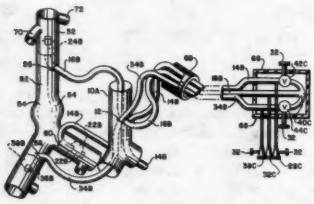
being readily detachable from that portion of the patient's body to which the device is applied.

4,592,754

SURGICAL PROSTHETIC VESSEL GRAFT AND CATHETER COMBINATION AND METHOD

Pradeep M. Gupte, 7 Victoria Dr., Suffern, N.Y. 10901, and Ravi K. Sundaram, 2A Beechwood Hall, Westchester County Medical Center, Valhalla, N.Y. 10595

Filed Sep. 9, 1983, Ser. No. 530,727
Int. Cl.[4] A61F *2/06*
U.S. Cl. 623—1 **12 Claims**



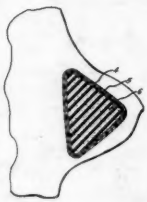
1. A surgical prosthetic vessel graft and catheter combination comprising a prosthetic vessel graft having a limited opening in the wall thereof, a catheter device having at least two interconnected tubular arms extending through said graft wall opening and extending through the interior of said graft and through opposite ends of said graft, the end of each of said arms including an inflatable balloon collar for secure connection to the interior of a vessel to be repaired by inflation of said balloon collar, said catheter device including individual inflation tubes for each of said balloon collars extending through said graft wall opening to said respective balloon collars and said inflation tubes for said balloon collars being combined with the respective arms of said catheter device, said interconnected tubular arms including interconnected inner passages for the passage of a body fluid such as blood for the purpose of providing a shunt connection for the transmission of the body fluid through said catheter to thereby shunt a section of a vessel to be repaired during that repair.

4,592,755

MAMMARY IMPLANT

Harold R. Penton; Michael E. Kucsma, and F. Alexander Pettigrew, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 11, 1985, Ser. No. 743,524
Int. Cl.[4] A61F *1/24*
U.S. Cl. 623—8 **34 Claims**



1. An article of manufacture suitable for use as a body implant, said article comprising a supple liquid-impermeable sac defining a cavity, said cavity containing an inert stable liquid, said sac comprising a continuous film of a cured polyphosphazene elastomer composition.

4,592,756

DYE SOLUTION COMPOSITION

Sinjiro Kawasaki, Nishinomiya; Hideo Kitagawa, Kyoto, and Yutaka Nishii, Moriguchi, all of Japan, assignors to Taoka Chemical Company, Limited, Osaka, Japan

Filed Feb. 6, 1985, Ser. No. 698,706

Claims priority, application Japan, Feb. 9, 1984, 59-24137

Int. Cl.[4] C09B *67/00*; C09D *11/00*

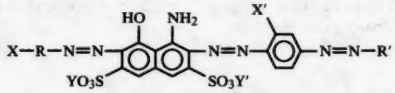
U.S. Cl. 8—527 11 Claims

1. A dye solution composition containing a dye obtained by reacting at least one acid selected from the group consisting of:

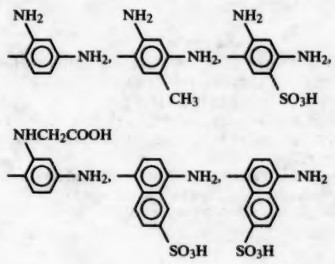
$OH(CH_2)_nSO_3H$, $Cl(CH_2)_nCOOH$ and $Br(CH_2)_nCOOH$

wherein n is an integer of 1 or 2, or salts thereof, with one or a mixture of dyes represented by the general formula (I):

(I)



wherein R is phenylene or naphthylene; X and X′ are each H, sulfonic acid or sulfonate; Y and Y′ are each H or alkali metal; R′ is an amino group-containing radical selected from the group consisting of:



and carboxylates and sulfonates thereof except that when R′ does not contain a sulfonic acid group, X and X′ are not the same and when R′ contains a sulfonic acid group, X and X′ are each H.

4,592,757

PRODUCTION OF DYED OR UNDYED WOOL WITH AN ANTIFELTING FINISH: QUATERNIZED PIPERAZINE CONDENSATE

Rolf Fikentscher, Ludwigshafen; Heinrich Mertens, Frankenthal, and Klaus Reincke, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 1, 1985, Ser. No. 729,221

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417239

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—567 10 Claims

1. A process for the production of undyed wool with an antifelting finish, by chlorinating the wool at a pH of less than 4, and applying onto the wool an aqueous solution of a cationic quaternary condensate which is obtained by condensation of

(a) piperazine, bis-(1,4-aminopropyl)-piperazine, 1-aminoethylpiperazine, 2-hydroxyethylpiperazine, bisbenzylpiperazine or 1-methylpiperazine, or a mixture of these, with

(b) ethylene chloride, an epihalohydrin, propylene chloride, 1,3-dichloro-2-hydroxypropane, bis-epoxybutane or 1,4-dichlorobutane, or a mixture of these, in a molar ratio of from 1:0.5 to 1:1.1, and quaternization of the condensate with benzyl chloride, from 0.15 to 1.0 mole of benzyl chloride being employed per equivalent of nitrogen in component (a) in the quaternization.

4,592,758

AFTER-TREATMENT OF DYED TEXTILE MATERIALS OF NATURAL POLYAMIDES OR NYLONS WITH QUATERNIZED PIPERAZINE CONDENSATE

Rolf Fikentscher, Ludwigshafen; Heinrich Mertens, Frankenthal; Klaus Reincke, Wachenheim, and Michele Vescia, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 1, 1985, Ser. No. 729,229

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417240

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—567 5 Claims

1. A process for the after-treatment of textile materials of natural polyamides or nylons, which have been dyed with a dye containing acid groups, which consist essentially of:

(1) treating said dyed textile material with a dilute aqueous solution of a cationic quaternary condensate which is obtained by reaction of

(a) piperazine, bis-(1,4-aminopropyl)-piperazine, 1-aminoethylpiperazine, 2-hydroxyethylpiperazine, bisbenzylpiperazine or 1-methylpiperazine, or a mixture of these, with

(b) ethylene chloride, an epihalohydrin, propylene chloride, 1,3-dichloro-2-hydroxypropane, bis-epoxybutane or 1,4-dichlorobutane, or a mixture of these, in a molar ratio of from 1:0.5 to 1:1.1, and

(2) quaternizing the condensate with benzyl chloride, from 0.15 to 1.0 mole of benzyl chloride being employed per equivalent of nitrogen in component (a) during the quaternization.

4,592,759

PRODUCTION OF AQUEOUS COAL SLURRIES HAVING HIGH COAL CONTENTS

Akihiro Naka, Joyo; Tominobu Mayuzumi, and Hiroshi Sugiyama, both of Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Feb. 17, 1984, Ser. No. 581,455

Claims priority, application Japan, Feb. 25, 1983, 58-31535; Mar. 1, 1983, 58-34279; Mar. 2, 1983, 58-35114

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 10 Claims

1. In a method for forming aqueous coal slurries which comprises pulverizing coarse coal particles in the presence of an amount of water sufficient to form said slurries having a coal concentration from 60 to 80% by weight until the coal particles are pulverized to at least 70% passing through a standard 200 mesh screen, the improvement wherein said wet pulverization of coal is carried out also in the presence of a polyether of a molecular weight from 16,000 to 300,000 and selected from the group consisting of a polyoxyalkylene adduct (a) with a polyhydroxyl compound having at least three hydrogen atoms; a polyoxyalkylene adduct (b) with a condensate, having a degree of condensation of at least 2, of a phenolic compound with an aliphatic aldehyde, a polyoxyalkylene adduct with a polyalkyleneimine or a derivative thereof containing 7 to 200 nitrogen atoms; and derivatives (c) of said adducts (a) or (b) which are esters, at the terminal hydroxyl groups of said adducts (b) or (c), with inorganic or organic acids, halides, aldehydes, carboxylic acids or urethanes with monoisocyanates.

4,592,760

COAL SLURRY

George T. Colegrove, San Diego, and Thomas A. Lindroth, Spring Valley, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 22, 1985, Ser. No. 692,952
Int. Cl.[4] C10L 1/32
U.S. Cl. 44—51 9 Claims

1. An aqueous slurry containing coal and a biosynthetic polysaccharide which is S-194 or S130.

4,592,761

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 20, 1985, Ser. No. 778,019
Int. Cl.[4] C10L 1/18
U.S. Cl. 44—57 10 Claims

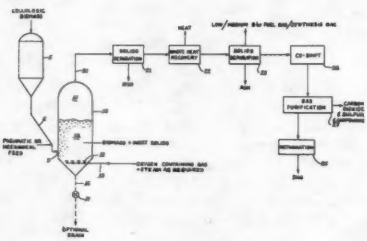
1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) a mixture of ortho-tert-butylated phenols, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,592,762

PROCESS FOR GASIFICATION OF CELLULOSIC BIOMASS

Suresh P. Babu, Willow Springs; Gerald L. Anderson, Romeoville, and Satyendra P. Nandi, Downers Grove, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 313,818, Oct. 22, 1981, abandoned. This application Aug. 2, 1983, Ser. No. 519,744
Int. Cl.[4] C10J 3/54
U.S. Cl. 48—197 R 37 Claims



1. A process for gasification of cellulosic biomass in a single gasification and combustion vessel comprising the steps:

introducing cellulosic biomass of up to about 50 weight percent moisture directly into a single, highly back-mixed fluidized bed of high heat capacity inert solids in said vessel;

maintaining said fluidized bed at temperatures of about 1200° to about 1600° F., said highly back-mixed fluidized state maintaining the temperature variation throughout the height of said fluidized bed at less than about 75° F., at a pressure of up to about 500 psig, devolatilizing said biomass in hydrogen-rich atmosphere in an upper portion of said bed forming methane, heavier hydrocarbons, carbon oxides, steam, hydrogen and devolatilized biomass;

reforming a substantial portion of said heavy hydrocarbons into methane, carbon oxides and steam within said fluidized bed and in the head space of said vessel;

mixing said devolatilized biomass throughout said fluidized bed and gasifying a substantial portion of said devolatilized biomass by reaction with hydrogen and steam within said upper portion of said bed producing methane, carbon oxides, hydrogen and biomass residue;

combusting said biomass residue in an oxygen-rich atmosphere in a combustion zone in a lower portion of said bed to principally form heat and biomass ash, said heat being directly transferred to said inert solids in said single fluidized bed to maintain said fluidized bed temperatures;

introducing and distributing oxygen containing gas to said bed below said combustion zone to maintain said oxygen-rich atmosphere, said oxygen introduced in an amount which is substantially less than stoichiometrically required for combustion of said biomass residue, so that said oxygen containing gas is substantially consumed in said combustion zone;

removing formed gases, vapor and substantially all of said biomass ash in a gas stream from the top of said gasification vessel; and

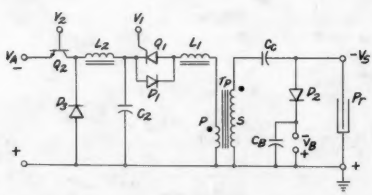
maintaining said introduction of cellulosic biomass to said bed at a point where said combustion consumes principally biomass residue.

4,592,763

METHOD AND APPARATUS FOR RAMPED PULSED BURST POWERING OF ELECTROSTATIC PRECIPITATORS

Peter W. Dietz, Schenectady, and Philip H. Peters, Greenwich, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 482,677, Apr. 6, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,170
Int. Cl.[4] B03C 3/68; G05B 24/02
U.S. Cl. 55—2 12 Claims



1. A method of operating an electrostatic precipitator, including two electrodes, comprising the steps of:

applying a burst of high voltage pulses across the electrodes of said precipitator for a period of time T_1, wherein said T_1 time period is chosen to be less than the ion transit time between said electrodes, the period between successive ones of said pulses being T_2, wherein said T_2 time period is small enough to prevent back-corona discharge, and wherein T_1 must be greater than T_2, the pulses in said burst exhibiting peak voltage levels which increase from pulse to pulse within said burst such that a substantially uniform current is injected between said electrodes during said burst;

interrupting the application of said burst for a time period of T_3, wherein said T_3 time period is chosen to be greater than the ion transit time between said electrodes; and

periodically repeating said above-recited steps.

4,592,764
VACUUM CLEANER

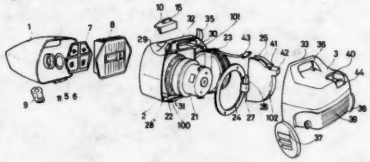
Katuzi Ikezaki, Sakai, and Kiyoshi Ishii, Nishinomiya, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1984, Ser. No. 598,675

Claims priority, application Japan, Jun. 30, 1983, 58-103269[U]; Jun. 30, 1983, 58-103270[U]; Jun. 30, 1983, 58-103271[U]; Jun. 30, 1983, 58-103272[U]; Sep. 2, 1983, 58-136934[U]; Sep. 2, 1983, 58-136935[U]; Sep. 14, 1983, 58-143360[U]; Sep. 16, 1983, 58-144415[U]; Sep. 19, 1983, 58-145502[U]

Int. Cl.[4] B01D *46/04;* **A47L** *9/12, 9/20, 9/22*

U.S. Cl. 55—276 **14 Claims**



1. A vacuum cleaner comprising:

a body member divided into

a front subassembly having an exhaust side and containing a suction port, said front subassembly defining a case for collecting dust,

a central subassembly removably connected to the exhaust side of the front subassembly, said central subassembly containing a fan means acting as an evacuating device,

a cord reel unit connected to the fan means, said cord reel unit being provided with a cord reel cover and vertically positioned adjacent to the fan means, whereby the cord reel unit is fixed to said fan means via the cord reel cover, said cord reel cover screening the exhaust gas from said cord reel unit, and

a rear subassembly removably connected to the central subassembly and functioning to cover the rear side of the fan means disposed in the central subassembly, said rear subassembly containing an exhaust port for removing exhaust gas therefrom.

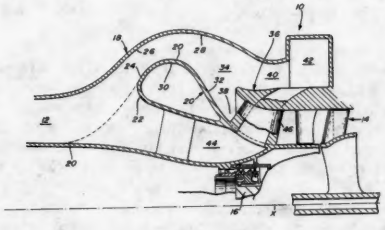
4,592,765
INERTIAL SEPARATOR

Daniel S. Breitman, Oakville, and Ernest G. Dueck, Orangeville, both of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada

Filed Jan. 15, 1985, Ser. No. 691,660

Int. Cl.[4] B01D *45/16*

U.S. Cl. 55—306 **1 Claim**



1. In a gas turbine engine compressor inlet, an airflow particle separator having an axis, the inlet having an inner wall and an outer wall of circular cross-section respectively defining an axial annular passageway, said inner wall including an inner wall portion diverging in a downstream direction away from the separator axis, a bypass opening defined in the inner wall immediately upstream of the diverging wall portion, the bypass opening communicating with a bypass conduit which in turn communicates with a collector shroud adapted to dump said particles outboard, the inner and outer walls forming a throat in the area of maximum divergence of the inner wall, the inner wall converging downstream of the throat area towards the axis of the separator, a splitter ring provided in the passageway between the inner wall and the outer wall downstream of the throat to form a core passage and a bypass passage, the bypass passage communicating with said collector shroud whereby the inertia of the particles in the airflow will tend to cause the particles to pass through the bypass opening immediately upstream of the diverging inner wall and the remaining particles in the airflow being deflected through the bypass passage at the splitter ring.

4,592,766
PARALLEL STREAM HEAT EXCHANGE FOR SEPARATION OF ETHANE AND HIGHER HYDROCARBONS FROM A NATURAL OR REFINERY GAS

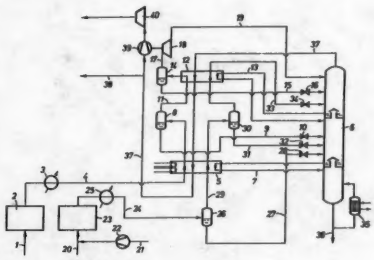
Paul Kumman, Munich, and Gerhard Ranke, Pocking, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,016

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332943

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—18 **20 Claims**



1. In a process for the separation of ethane and higher hydrocarbons from incoming raw gas under pressure containing methane, ethane and higher hydrocarbons, comprising cooling and expanding said incoming gas in several serially connected stages comprising heat exchangers and phase separators and withdrawing resulting condensates from the corresponding phase separators of each stage, work expanding resultant cooling high-pressure gas from a phase separator and feeding resultant condensates from the cooling and expansion stages to a rectifying column, and withdrawing from said rectifying column an overhead gaseous product consisting essentially of methane and a bottoms product consisting essentially of ethane and higher hydrocarbons, the improvement comprising, passing the incoming gas into the process in at least two separate streams, said streams being under different pressures, and conducting said cooling of said different streams of incoming gas in parallel in at least one of the same heat exchangers, and in indirect heat exchange with said overhead gaseous product consisting essentially of methane.

13. In a process for the separation of ethane and higher hydrocarbons from incoming raw gas under pressure containing methane, ethane and higher hydrocarbons, comprising cooling and expanding said incoming gas in several serially connected stages comprising heat exchangers and phase separators and withdrawing resulting condensates from the corresponding phase separators of each stage, work expanding resultant cooling high-pressure gas from a phase separator and feeding resultant condensates from the cooling and expansion stages to a rectifying column, and withdrawing from said

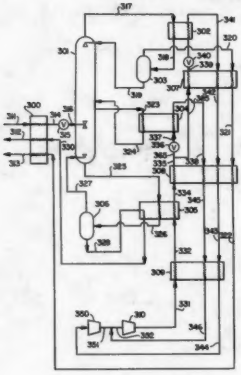
rectifying column an overhead gaseous product consisting essentially of methane and a bottoms product consisting essentially of ethane and higher hydrocarbons, the improvement comprising, work expanding the resultant cooled high-pressure gas to a pressure above the operating pressure of the rectifying column; separating the resultant work-expanded fluid into vapor and liquid phases; passing and the resultant vapor phase and said overhead product from the rectifying column, under different pressures, in parallel streams through at least one of said heat exchangers where said resultant vapor phase and said overhead gaseous product are heated while cooling said incoming gas.

4,592,767

PROCESS FOR SEPARATING METHANE AND NITROGEN

Ravindra F. Pahade, North Tonawanda; John B. Saunders, and James J. Maloney, both of Tonawanda, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 29, 1985, Ser. No. 739,082
Int. Cl.[4] F25J 3/02
U.S. Cl. 62—31 **8 Claims**



1. A process for the separation of methane and nitrogen comprising providing added refrigeration to the process at required column temperature levels by a recirculating fluid heat pump, while precluding the need for significant amounts of outside added refrigeration or large expansion of process streams, by the steps of:

(a) introducing a feed comprising methane and nitrogen into a rectification column operating at a pressure in the range of from 200 to 450 psia;

(b) separating the feed in said column into a nitrogen-enriched vapor and a methane-enriched liquid;

(c) partially condensing nitrogen-enriched vapor by indirect heat exchange with heat pump fluid to warm the heat pump fluid;

(d) employing at least some of the resulting liquid of step (c) as reflux liquid for the column;

(e) partially vaporizing methane-enriched liquid by indirect heat exchange with warm heat pump fluid;

(f) employing at least some of the resulting vapor of step (e) as reflux vapor for the column;

(g) warming remaining methane-enriched liquid of step (e) by indirect heat exchange with warm heat pump fluid wherein not more than 75 percent of said remaining methane-enriched liquid is vaporized;

(h) further warming the warmed methane-enriched fluid of step (g) by indirect heat exchange with feed prior to the introduction of said feed into the column; and

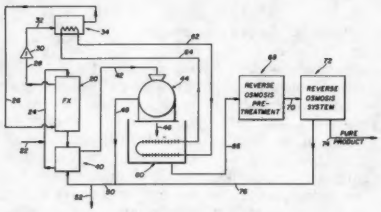
(i) recovering resulting methane-enriched fluid as product methane, thereby providing refrigeration to the column at or below column temperature levels.

4,592,768

APPARATUS AND PROCESS FOR DESALINATION COMBINING FREEZE CONCENTRATION, CENTRIFUGATION, AND REVERSE OSMOSIS

Donald R. Cutler, Bolingbrook, Ill., and Alan R. Blankshain, Murray, Utah, assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Oct. 20, 1983, Ser. No. 543,760
Int. Cl.[4] B01D 9/04
U.S. Cl. 62—532 **8 Claims**



1. Apparatus comprising means designed for producing potable water from brine by converting brine to ice containing residual brine adhering to the ice and removing the brine from the ice to yield potable water when melted, the means comprising:

a freeze exchanger in which brine is indirectly cooled by heat exchange with a cooling fluid to produce brine containing ice;

a centrifuge;

conduit means for feeding an ice slurry from the freeze exchanger to the centrifuge to separate ice from the brine;

a heater;

conduit means for feeding the ice from the centrifuge to the heater to melt the ice;

a water treatment apparatus;

conduit means for feeding the water from the heater to the water treatment apparatus to condition the water for contact with a reverse osmosis membrane;

a reverse osmosis apparatus; and

conduit means for feeding the conditioned water from the treatment apparatus to the reverse osmosis apparatus in which the water is purified by reverse osmosis.

5. A method comprising producing potable water from brine by converting brine to ice containing residual brine adhering to the ice and removing the brine from the ice to yield potable water when melted, including:

feeding brine into indirect heat exchange with a cooling fluid to produce ice particles in the brine and thus to form an ice slurry;

centrifuging the ice slurry to separate the ice and brine;

melting the separated ice and treating the resulting water to remove components which damage a reverse osmosis membrane; and

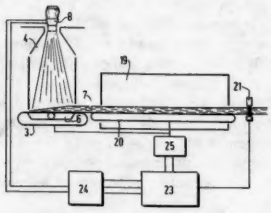
subjecting the treated water to reverse osmosis using a reverse osmosis membrane to produce potable water and an impure water stream.

4,592,769

PROCESS AND APPARATUS FOR THE FORMATION OF FIBER FELTS

Henry Lemaignen, Chantilly, France, assignor to Isover Saint-Gobain, Courbevoie, France

Filed Mar. 9, 1984, Ser. No. 587,980
Claims priority, application France, Mar. 10, 1983, 83 03919
Int. Cl.[4] C03B 37/065
U.S. Cl. 65—4.4 10 Claims



1. A process for improving the distribution of fibers in a felt formed by blowing a gaseous current carrying fibers onto a perforated conveyor which retains said fibers while allowing said gas to pass therethrough, said process comprising:

directing said current to sweep over the width of said conveyor in an oscillating movement,

and automatically regulating during operation the frequency, amplitude and median direction of said sweep and the speed of said conveyor according to measurements taken of the mass of fibers per unit surface area of the width of said formed felt,

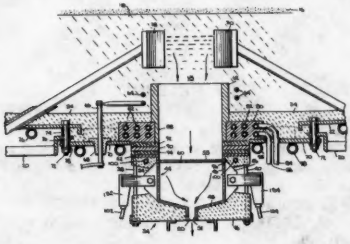
said regulation being calculated to minimize deviations in the value of said mass across the width of said felt.

4,592,770

GLASS MELTER

William O. Pearman, Nashville; Joseph L. Hunt, Brentwood, and William P. Cunningham, Thompson Station, all of Tenn., assignors to GAF Corporation, Wayne, N.J.

Filed Jun. 15, 1984, Ser. No. 620,885
Int. Cl.[4] C03B 5/26
U.S. Cl. 65—128 18 Claims



1. A glass melter comprising, a melter body defining a containment chamber for receiving raw batch material, melting means in said chamber for heating said raw batch material to a molten glass state, an outlet member for said melter body defining an outlet flow path and having an outlet opening of predetermined size, guide means inside said containment chamber but above said outlet member and insulated from said outlet member for directing the flow of molten glass to said outlet member, cooling means positioned so as to cool glass in said guide means electrical power means communicating directly with said outlet member such that said outlet member acts as a resistance and heats up in accordance with the amount of electric power furnished by said power supply means to said outlet member, and temperature control means communicating with said outlet member and said power supply means for controlling the amount of heat buildup in said outlet member to control the viscosity of the molten glass along said outlet flow path and passing through said outlet opening, whereby the resistive heating of said outlet member is used without any flow restricting valves to control the outlet flow rate of said molten glass from said melter body.

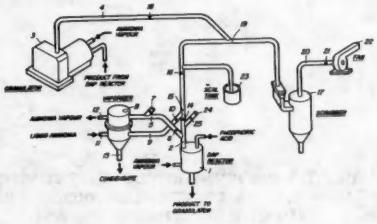
15. A method of preparing molten glass comprising, continuously melting raw batch material to a first molten glass state, maintaining the molten glass in a containment chamber, establishing an outlet flow path from the containment chamber through guide means to an outlet member which is insulated from the guide means to limit heat exchange between the guide means and the outlet member, flowing the molten glass from the containment chamber to the outlet member, and varying the rate of flow of the molten glass through the outlet member by initially cooling the glass in the guide means and then using the outlet member as a resistance to accomplish an electrical heat buildup in the outlet member to heat the outlet member to control the viscosity of the molten glass passing through the outlet member, whereby the resistive heating of the outlet member is used without any flow restricting valves to control the outlet flow rate of molten glass from the containment chamber.

4,592,771

METHOD OF PRODUCING DI-AMMONIUM PHOSPHATE FERTILIZER

Loftus A. Benjamin, Bathurst; Donald T. Aikens; Thomas B. Gravestock, both of Belledune, and Herman Soehodho, Bathurst, all of Canada, assignors to Brunswick Mining and Smelting Corporation Ltd., Toronto, Canada

Filed Aug. 29, 1984, Ser. No. 645,263
Int. Cl.[4] C05B 7/00
U.S. Cl. 71—34 8 Claims



1. A method for operating a DAP reactor and granulator system, which comprises:

(a) diverting part of the hot exhaust gases from the DAP reactor to a vaporizer in which liquid ammonia is maintained at a predetermined level;

(b) flowing said diverted gases through tubes in said vaporizer and controlling the flow thereof so as to continually evaporate ammonia at a desired vapour pressure to supply the DAP reactor and the granulator, thereby also forming condensate in said tubes which flows out of the vaporizer;

(c) recombining the gases coming out of the vaporizer with the non diverted gases from the DAP reactor and sending them to a scrubber and exhaust; and

(d) supplying the produced vaporized ammonia to the DAP reactor and the granulator at required rates.

4,592,772

(−)-ANTIPODE OF (E)-1-CYCLOHEXYL-4,4-DIMETHYL-3-HYDROXY-2-(1,2,4-TRIAZOL-1-YL)-PENT-1-ENE

Udo Kraatz, Leverkusen; Wolf Reiser, Wuppertal; Karl H. Büchel, Burscheid, and Klaus Lürssen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

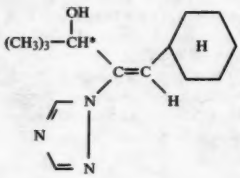
Filed Jan. 16, 1984, Ser. No. 571,019

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302122

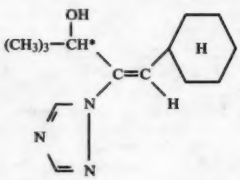
Int. Cl.[4] A01N *43/647;* C07D *249/08*

U.S. Cl. 71—76 11 Claims

1. A substantially pure (−)-antipode of (E)-1cyclohexyl-4,4-dimethyl-3-hydroxy-2-(1,2,4-triazol-1-yl)-pent-1-ene of the formula



2. A plant growth regulating agent comprising an effective amount of (−)-antipode of (E)-1-cyclohexyl-4,4-dimethyl-3-hydroxy-2-(1,2,4-triazol-1-yl)-pent-1-ene of the formula



substantially free of the (+) antipode and a diluent.

4,592,773

SUBSTITUTED PROPARGYLOXYACETONITRILE DERIVATIVES, PROCESS FOR PRODUCTION THEREOF, AND HERBICIDE AND AGRICULTURAL-HORTICULTURAL FUNGICIDE COMPRISING SAID DERIVATIVES AS ACTIVE INGREDIENTS

Yoshinori Tanaka, Yokohama; Kazuya Sakai, Mobara; Toshiyuki Kouno, Chosei; Mithuo Itakura; Koichi Takeuchi, both of Mobara; Yuji Enomoto, Yokohama; Hitoshi Shimotori, Yokohama; Shunichi Inami, Yokohama; Yoshikata Hojo, Yokohama, and Masahiro Sakakibara, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

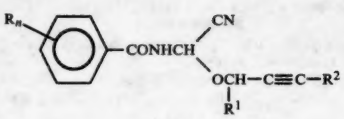
Filed Aug. 5, 1985, Ser. No. 762,382

Claims priority, application Japan, Aug. 10, 1984, 59-166316; Nov. 28, 1984, 59-249627

Int. Cl.[4] A01N *43/30, 37/34;* C07C *121/80*

U.S. Cl. 71—88 18 Claims

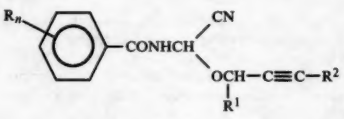
1. A substituted propargyloxyacetonitrile derivative represented by the general formula (I)



(I)

wherein R represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower haloalkyl group, a lower alkoxy group, a methylenedioxy group, a nitro group or a cyano group, n represents an integer of 1 to 5 and when n is an integer of 2 or more, R's may be identical or different, R^1 represents a hydrogen atom or a lower alkyl group, and R^2 represents a hydrogen atom, a lower alkyl group, a lower haloalkyl group or a halogen atom, provided that R^1 and R^2 are not simultaneously hydrogen atoms.

10. A herbicide comprising at least one substituted propargyloxyacetonitrile derivative represented by the general formula (I)



(I)

wherein R represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower haloalkyl group, a lower alkoxy group, a methylenedioxy group, a nitro group or a cyano group, n represents an integer of 1 to 5 and when n is an integer of 2 or more, R's may be identical or different, R^1 represents a hydrogen atom or a lower alkyl group, and R^2 represents a hydrogen atom, a lower alkyl group, a lower haloalkyl group or a halogen atom, provided that R^1 and R^2 are not simultaneously hydrogen atoms,

as an active ingredient and a liquid or solid diluent or carrier, and/or a surface-active agent.

4,592,774

HERBICIDAL ALPHA HETEROCYCLIC CARBINOL CARBAMATES, UREAS AND N-ALPHA-SUBSTITUTED ACETYLCARBAMATES

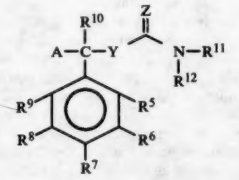
Tai-Teh Wu; Jamin Huang, both of Chapel Hill, and David T. Manning, Raleigh, all of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 22, 1983, Ser. No. 564,376

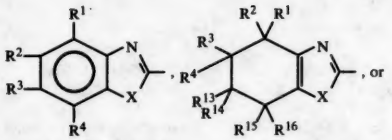
Int. Cl.[4] C07D *263/58, 277/68;* A01N *43/76, 43/78*

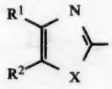
U.S. Cl. 71—90 23 Claims

1. A compound of the formula:



wherein:





X is O, or NR;
Y is O, or S;
Z is O, or NR;
R is H or alkyl;
R^1 through R^9 inclusive and R^{13} through R^{16} inclusive are individually: hydrogen, halogen, alkyl, cycloalkyl, haloalkyl, halocycloalkyl, alkoxy, haloalkoxy, alkylthio, alkylamino, dialkylamino, nitro, cyano: or phenyl, phenoxy, or phenylthio unsubstituted or substituted with alkyl, alkoxy, alkylthio, halogen, nitro, cyano, amino, haloalkyl, alkylamino, dialkylamino, alkoxycarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkanoyl, aroyl, alkenyl, or alkynyl;
R^{10} is hydrogen, alkyl, cycloalkyl, haloalkyl, halocycloalkyl, aryl, cyano, alkynyl; and
R^{11} and R^{12} are individually hydrogen, C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio: or phenoxy; unsubstituted or substituted with halo, alkyl, alkoxy, nitro, cyano, alkylthio, alkylamino; alpha-haloacetyl, acety, alpha-alkylthioacetyl, alpha-aminoacetyl, alpha-alkoxyacetyl, alpha-phosphonoacetyl, phosphinoacetyl, phosphinylacetyl, or propionyl.

4,592,775

BENZENESULFONAMIDES AS HERBICIDES

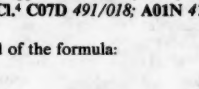
Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 437,367, Nov. 1, 1982, Pat. No. 4,460,401, which is a continuation-in-part of Ser. No. 337,933, Jan. 7, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 626,905

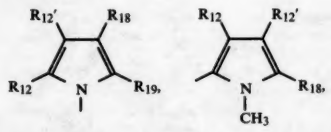
Int. Cl.[4] C07D *491/018;* **A01N** *47/36*

U.S. Cl. 71—90 **14 Claims**

1. A compound of the formula:

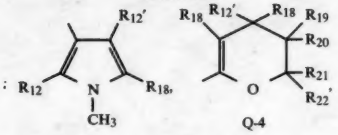


where Q is

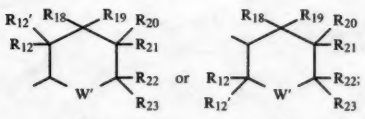


Q-1 Q-2

-continued

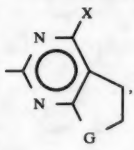


Q-3 Q-4



Q-5 Q-6

where
W is O or S;
W′ is O or S;
R_1 is H, F, Cl, Br, CH_3, CF_3 or OCH_3;
R_{12} is H or CH_3;
R_{12}' is H or CH_3;
R_{13} is H or CH_3;
R_{18} is H or CH_3;
R_{19} is H or CH_3;
R_{20} is H or CH_3;
R_{21} is H or CH_3;
R_{22} is H or CH_3;
R_{23} is H or CH_3;
A is



X_1 is CH_3, OCH_3 or C_1;
G is O
and their agriculturally suitable salts; provided that
(1) when W is S, then R_{13} is H; the total number of carbon atoms in R_{12}, R_{12}', R_{18}, R_{19}, R_{20}, R_{21}, R_{22} and R_{23} is less than or equal to 4.

4,592,776

SULFAMOYL UREA DERIVATIVES

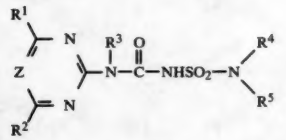
Barry Van Gemert, Massillon, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1985, Ser. No. 698,001

Int. Cl.[4] C07D *251/16, 251/18, 251/46;* **A01N** *43/66*

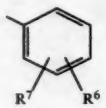
U.S. Cl. 71—93 **5 Claims**

1. A compound represented by the formula:

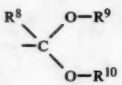


wherein:
Z is N;
R^1 and R^2 are the same or different and represent halogen or C_1 to C_4 alkyl, or alkoxy;
R^3 and R^4 are the same or different and represent hydrogen,

C_1 to C_4 alkyl, alkoxyalkyl, haloalkyl, or up to C_3 alkenyl or alkynyl;
R^5 is



wherein:
R^6 is hydrogen or halogen;
R^7 is



wherein:
R^8 is hydrogen or C_1 to C_3 alkyl; and
R^9 and R^{10} are C_1 to C_6 alkyl.

4,592,777

METHOD, PROCESS AND COMPOSITION FOR DESULFURIZING PIG-IRON MELTS

Heinrich Rellermeyer, Duisburg; Walter Meichsner, Krefeld, and Werner Gmöhling, Hufschlag, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Dusseldorf and SKW Trostberg AG, Trostberg, both of, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,174

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418075

Int. Cl.[4] C21C *7/02*

U.S. Cl. 75—58 **49 Claims**

1. A method for desulfurizing pig-iron which comprises introducing into said pig-iron a composition comprising:

(A) calcium carbide and at least one compound which under the conditions of said pig-iron releases hydrogen; and

(B) magnesium.

4,592,778

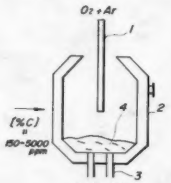
STEELMAKING OF AN EXTREMELY LOW CARBON STEEL IN A CONVERTER

Tetsuya Fujii; Nobuo Harada; Shuji Takeuchi; Yoshiei Kato; Hideo Nakamura; Toshikazu Sakuraya, and Yasuhiro Habu, all of Chiba, Japan, assignors to Kawasaki Steel Company, Kobe, Japan

Filed Jun. 18, 1985, Ser. No. 745,922

Int. Cl.[4] C21C *7/00*

U.S. Cl. 75—59.22 **7 Claims**



1. A process for producing an extremely low carbon steel in a top- and bottom-blown converter, which process comprises top-blowing a mixed gas of oxygen gas and an inert gas onto a molten steel in the top- and bottom-blown converter, through a top-blowing lance at a final decarburization stage during blowing in the converter, while a gas is bottom-blown into the molten steel.

4,592,779

METHOD FOR RECOVERING PRECIOUS METALS FROM PRECIOUS METAL-BEARING MATERIALS SUCH AS ORE AND TAILINGS

James J. Russ, P.O. Box 305, Lawrenceburg, Tenn. 38464, and John W. Smith, 1550 W. Churchill, Germantown, Tenn. 38138

Filed Mar. 9, 1984, Ser. No. 588,093

Int. Cl.[4] C22B *3/00, 11/04*

U.S. Cl. 75—101 R **15 Claims**

1. A method for recovering at least one precious metal from a mixture including said at least one precious metal comprising treating a mixture including at least one precious metal and other solids with a substantially cyanide ion-free aqueous basic solution having a pH in the range of about 12 to about 14 for a time sufficient to suspend said at least one precious metal in substantially free form in said solution, said time being at least about 20 minutes; separating the unsuspended, undissolved solids from said solution; and recovering said at least one suspended precious metal from the aqueous basic solution.

4,592,780

PRODUCTION OF FLAT PRODUCTS IN STRIP SHEET OR LIKE FORM

Idwal Davies, Mold, Wales, and John L. Fage, Ellesmere, England, assignors to Mixalloy Limited, Clywd, Wales

Filed Apr. 4, 1985, Ser. No. 719,699

Claims priority, application United Kingdom, Apr. 7, 1984, 8409046

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—229 **12 Claims**

1. A process for producing a flat product which includes the steps of:

forming a slurry from a film forming cellulose derivative containing, in suspension, a quantity of metallic particles and a quantity of added matter whose chemical composition and physical properties differ from those of the metallic particles;

mixing the slurry to disperse the metallic particles and added matter uniformly within the cellulose derivative whereby the slurry comprises a substantially homogeneous mix of the metallic particles and added matter in suspension within the cellulose derivative;

depositing a quantity of this slurry onto a support surface;

heating the slurry to promote gelling of the cellulose derivative to retain the homogeneity achieved in the slurry;

drying the slurry to form a self-supporting dried flat product;

removing the dried flat product from the support surface;

compacting the dried flat product; and

heating the compacted dried flat product to a temperature at which the added matter is, at most, only partially taken into solution with the metallic particles whereby the presence of evenly distributed added matter can readily be detected following such heat treatment.

4,592,781

METHOD FOR MAKING ULTRAFINE METAL POWDER

Richard F. Cheney, Sayre, and Richard H. Pierce, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

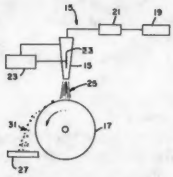
Continuation-in-part of Ser. No. 460,709, Jan. 24, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 581,522

Int. Cl.[4] C22C *29/14*

U.S. Cl. 75—249 **7 Claims**

1. A fine aluminum metallurgical powder suitable for compacting and sintering into densified articles consisting essentially of aluminum and less than 10 atomic percent additional components for enhancing the strength or hardness of densified articles, said powder consisting essentially of smooth

surfaced plasma densified particles being solidified from molten particles rebounding from a repellant surface wherein at



least about 80 percent of said particles have a size of less than about ten micrometers and at least a portion of said particles comprise said additional component.

4,592,782

COMPOSITION OF MATTER INCORPORATING POLYETHER ETHER KETONE

Glyndwr J. Davies, Uxbridge, England, assignor to AE PLC, Warwickshire, England

Filed Mar. 12, 1984, Ser. No. 588,386

Claims priority, application United Kingdom, Mar. 14, 1983, 8306989

Int. Cl.⁴ B22F *1/00*

U.S. Cl. 75—253 **6 Claims**

1. A bearing material comprising: 60 to 90% by weight of a polyether ketone having a melting temperature in excess of 330° C. and having physically intermixed therein between 10 and 40% by weight of a low friction, self-lubricating phase comprising polytetrafluoroethylene (PTFE), graphite and bronze.

4,592,783

RUST PREVENTIVES

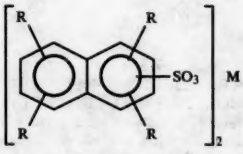
Hans Dressler, Monroeville; Samuel N. Holter, Pittsburgh, and Nancy Znidarsic, North Braddock, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 22, 1984, Ser. No. 663,213

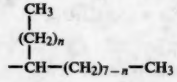
Int. Cl.⁴ C04B *9/02*

U.S. Cl. 106—14.05 **16 Claims**

1. Rust preventive water insoluble compounds of the formula

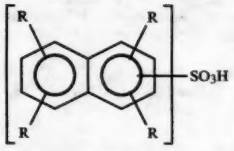


wherein the R groups are independently selected from methyl, hydrogen, and decyl of the formula

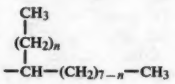


wherein n=0 to 3; and wherein from two to three R groups are decyl, zero to two R groups are methyl, and zero to two R groups are hydrogen; and M is a divalent metal selected from Mg, Ca, Ba, and Zn.

11. Rust preventive water insoluble compounds of the formula



wherein the R groups are independently selected from methyl, hydrogen, and decyl of the formula



wherein n=0 to 3; and wherein from two to three R groups are decyl, zero to two R groups are methyl, and zero to two R groups are hydrogen.

4,592,784

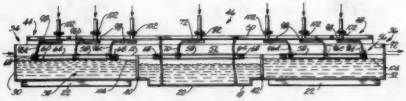
WATER SEAL FOR FUMELESS STRAND PICKLING SYSTEM

Mario Ghizzi, Orange, Calif., assignor to Davis Walker Corporation, Los Angeles, Calif.

Filed Jul. 2, 1984, Ser. No. 627,554

Int. Cl.⁴ B08B *1/02*

U.S. Cl. 134—15 **5 Claims**



1. A device for treating a product as it passes therethrough comprising:

a tank having an inlet opening to admit the product to be treated and an outlet opening for removal of the treated product;

a pair of fluid filled troughs each extending along a side of the tank;

a top covering the tank leaving only the inlet and outlet openings open, the top further including side skirts each of which is submerged in a trough when the top is positioned adjacent over the tank to seal the device along its sides against the escape of fumes;

means for treating the product between the inlet and outlet openings; and

means for continuously cascading a fluid across the inlet and outlet openings between the skirts to supply fluid to each of the troughs to define barriers against the escape of fumes from the treating means.

4. A method for treating a product comprising:

passing the product through a tank having an inlet opening to admit the product, an outlet opening for removal of the treated product and a pair of fluid filled troughs each extending along a side of the tank;

providing a top covering the tank leaving only the inlet and outlet openings open, the top having side skirts each of which is submerged in a trough when the top is positioned to close the tank to seal the device along its sides;

treating the product within the device between the inlet and outlet openings; and

continuously cascading a fluid across the inlet and outlet openings between the skirts to supply fluid to each of the troughs and to define barriers against the escape of fumes from the treating of the product.

4,592,785

PROTEINACEOUS SOIL REMOVAL PROCESS

Raymond L. Reinert, and Charles D. Kaufman, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Continuation of Ser. No. 561,954, Dec. 15, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 702,870

Int. Cl.[4] B08B 7/04

U.S. Cl. 134—18 11 Claims

1. In a process for washing soiled articles bearing proteinaceous soil with a wash water solution, the improvement of reacting proteinaceous soil and hypohalous halogen to solubilize the proteinaceous soil by controlling the amount of hypohalous halogen added to the wash water solution based on monitoring the pH of the wash water solution and stopping the addition of hypohalous halogen when the proteinaceous soil is substantially all solubilized comprising:

(a) first adding alkali to the wash water solution to bring the pH thereof to slightly below a selected target pH value in the range of 10 to 11;

(b) then adding to the wash water solution 5 to 50 milligrams of hypohalous halogen per liter of wash water solution and sufficient alkali to raise the pH of the wash water solution to the target pH value;

(c) tracking the reaction between proteinaceous soil and hypohalous halogen by monitoring the pH of said wash water solution for a drop in pH of at least 0.02 pH units occuring after the addition of the hypohalous halogen; and

(d) either terminating the addition of hypohalous halogen if no such drop in the pH occurs or repeating steps (b) and (c) until the 0.02 pH units drop is no longer detected in step (c), thereby ensuring substantially complete reaction with the proteinaceous soil.

4,592,786

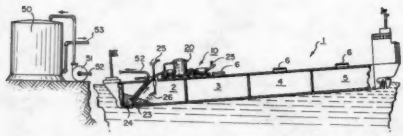
PROCESS FOR CLEANING AN OIL CONTAMINATED VESSEL

Joseph L. Williams; John W. Sansing, both of Greenville, Miss.; Michael E. Hayes, Fernandina Beach, and James F. Deal, Amelia Island, both of Fla., assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 512,489, Jul. 11, 1983, abandoned. This application Oct. 26, 1984, Ser. No. 649,247

Int. Cl.[4] B08B 3/02, 5/02

U.S. Cl. 134—22.18 13 Claims



1. A process for cleaning an oil contaminated vessel having at least one compartment containing sludge comprising the steps of initially adding a fluidizing agent containing an emulsifying agent to the one compartment to form an initial pool of fluidized sludge, pumping the fluidized sludge from the said one compartment to a tank, removing the fluidized sludge from the tank and spraying it under pressure onto the interior sides of said one compartment to further fluidize sludge therein, and thereafter continuously recirculating only fluidized sludge from said one compartment back to the tank in a closed fluidized circulation system containing only fluidized sludge therein and until said one compartment is substantially cleansed of sludge.

4,592,787

COMPOSITION USEFUL FOR STRIPPING PHOTORESIST POLYMERS AND METHOD

M. Anthony Johnson, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1984, Ser. No. 668,546

Int. Cl.[4] B08B 7/00; C09D 9/04

U.S. Cl. 134—38 18 Claims

1. A composiion suitable for stripping cross-linked photoresist polymer which comprises

(a) between about 40 and 75 percent by weight of a lower alkyl monoether of a propylene glycol, or a mixture of lower alkyl monethers of propylene glycol;

(b) between about 10 and 30 percent by weight of a C_{2-6} alkanol;

(c) between about 4 and 28 percent by weight of an alkanolamine; and

(d) between about 1 and 14 percent by weight of a base wherein the base is an alkali metal hydroxide, alkaline earth metal hydroxide, ammonium hydroxide, alkali metal carbonate, alkaline earth metal carbonate or ammonium carbonate.

11. A method of stripping corss-linked photoresist polymer from a substrate which comprises contacting a substrate upon which a cross-linked photoresist polymer is adhered with a stripper composition comprising

(a) between about 40 and 75 percent by weight of a lower alkyl monoether of a propylene glycol, or a mixture of lower alkyl monoethers of propylene glycol;

(b) between about 10 and 30 percent by weight of a C_{2-6} alkanol;

(c) between about 4 and 28 percent by weight of an alkanolamine; and

(d) between about 1 and 14 percent by weight of a base wherein the base is an alkali metal hydroxide, alkaline earth metal hydroxide, ammonium hydroxide, alkali metal carbonate, alkaline earth metal carbonate or ammonium carbonate;

wherein the stripper composition has a pH of 9 or greater, at a temperature at which the stripper composition is a single phase, for a time sufficient to strip the cross-linked photoresist polymer from the substrate, under conditions such that the cross-linked photoresist polymer is stripped from the substrate.

4,592,788

METHOD FOR PRESSURIZED WATER QUENCHING OF ROLLED STEEL PRODUCTS

Franz Tamm, Hennigsdorf; Bernhard Hoericke, Falkensee, and Arnold Joachim, Hennigsdorf, all of German Democratic Rep., assignors to VEB Stahl- und Walzwerk "Wilhelm Florin", Hennigsdorf, German Democratic Rep.

Filed Feb. 21, 1985, Ser. No. 703,643

Claims priority, application German Democratic Rep., Dec. 21, 1984, 2714355

Int. Cl.[4] C21D 7/10

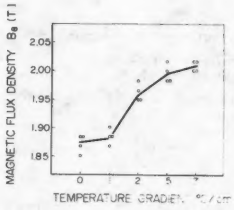
U.S. Cl. 148—12 B 3 Claims

1. A method for the pressurized water quenching of rolled steel products, whereby the residual heat remaining in the core causes an auto-tempering of the quenched peripheral layer, comprising quenching the rolled steel product so abruptly on its surface that at a quenching from the final rolling temperature of approximately 1000° C. to an equilibrium temperature of over 500° C., the temperature of the core immediately after completion of the quenching is no more than approximately 30° C. below the original final rolling temperature.

4,592,789
PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET OR STRIP

Yakichiro Kawamo; Yozo Suga; Tadao Nozawa, and Tadashi Nakayama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,001
Claims priority, application Japan, Dec. 11, 1981, 56-198443
Int. Cl.⁴ H01F *1/04*
U.S. Cl. 148—111 **8 Claims**



1. A process for producing a grain-oriented electro-magnetic steel sheet or strip, characterized in that a steel slab containing not more than 0.02% of carbon, not more than 5% of silicon, not more than 0.015% of sulfur, from 0.01% to 0.08% of acid-solution aluminum, and not more than 0.01% of nitrogen is heated to a temperature of not more than 1270° C. and hot-rolled with no α-γ transformation taking place followed by annealing of the hot-rolled strip at a temperature of from 750° C. for a period of less than 10 minutes, and is subsequently cold-rolled once, and, further, the resultant cold-rolled strip is subjected to primary recrystallization-annealing and then to high-temperature finishing annealing in which the growth of secondary recrystallized grains is completed under a condition in which a temperature gradient of at least 2° C. per centimeter is generated parallel to the sheet surface.

4,592,790
METHOD OF MAKING PARTICULATE URANIUM FOR SHAPED CHARGE LINERS

Alfred R. Globus, 26-53 210th St., Bayside, N.Y. 11360

Filed Feb. 20, 1981, Ser. No. 236,249
Int. Cl.⁴ C21D *1/00*
U.S. Cl. 148—126.1 **3 Claims**

1. A process for the production of metal coated depleted uranium particles comprising heating depleted uranium metal to red heat, rapidly chilling the heated metal to 0° F., grinding the resulting brittlized metal to form depleted uranium metal particles having a particle size of at most −100 mesh, annealing the particles, wherein the grinding and annealing are carried out in an inert argon atmosphere, after said annealing, removing the inert argon gas under conditions to provide a high vacuum stage and then vapor depositing one of silver, copper or lead metal onto said particles so as to form a uniform coating of said metal on said particles.

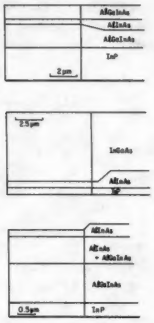
4,592,791
LIQUID PHASE EPITAXIAL GROWTH METHOD FOR PRODUCING A III-V GROUP COMPOUND SEMICONDUCTOR

Kazuo Nakajima, Kawasaki, and Toshiyuki Tanahashi, Atsugi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 21, 1983, Ser. No. 553,896
Claims priority, application Japan, Nov. 22, 1982, 57-204816
Int. Cl.⁴ H01L *21/208*
U.S. Cl. 148—171 **6 Claims**

1. A liquid phase epitaxial growth method comprising the steps of:

(a) preparing an indium phosphide substrate with crystal plane (111)A, and

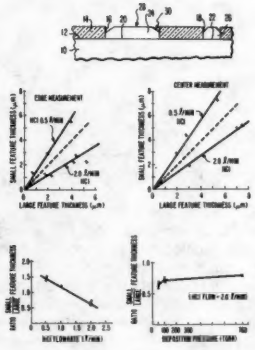


(b) growing an epitaxial layer of an aluminum-indium-arsenide ($Al_xIn_{1-x}As$) by liquid phase epitaxy on said substrate, wherein $x=0.48$.

4,592,792
METHOD FOR FORMING UNIFORMLY THICK SELECTIVE EPITAXIAL SILICON

John F. Corboy, Jr., East Amwell Township, Hunterdon County, and Lubomir L. Jastrzebski, Plainsboro, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 23, 1985, Ser. No. 694,100
Int. Cl.⁴ H01L *21/205, 21/76*
U.S. Cl. 148—175 **13 Claims**



1. In a method for depositing monocrystalline silicon on first and second selective portions of a substrate defined by a mask, said first portion having substantially unequal dimensions from said second portion, said method comprising subjecting said substrate to a silicon-source gas and chloride source at a predetermined temperature, the improvement comprising:

exposing said substrate to a predetermined concentration of chloride during said depositing, said chloride concentration being selected so as to create a monocrystalline silicon deposit on each of said portions, the thickness of each of said deposits being substantially equal.

4,592,793

PROCESS FOR DIFFUSING IMPURITIES INTO A SEMICONDUCTOR BODY VAPOR PHASE DIFFUSION OF III–V SEMICONDUCTOR SUBSTRATES

Harold J. Hovel, Katonah, and Thermon E. McKoy, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,300
Int. Cl.[4] H01L *21/223*
U.S. Cl. 148—189 22 Claims

1. A process for diffusing a dopant into a III–V type semiconductor body which comprises:

(a) placing in a heating chamber which is substantially devoid of any oxidizing substance a deposition substrate possessing a dopant-containing layer which has been vapor deposited upon a major surface thereof in contact with, or in the proximity of, an object substrate fabricated from a III–V type semiconductor material with the dopant-containing layer of the deposition substrate being substantially opposed to a major surface of the object substrate;

(b) introducing into the heating chamber a source of Group V element corresponding to the Group V element of the object substrate, said source being capable of providing Group V element in the vapor phase at the diffusion temperature with the vapor pressure of the vapor phase Group V element being at or above the equilibrium vapor pressure of the Group V element present at the surface of the object substrate; and

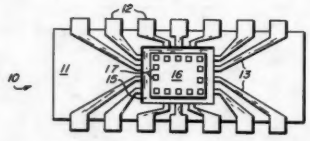
(c) heating the deposition substrate and the object substrate to the diffusion temperature for a period of time sufficient to diffuse a predetermined amount of dopant into the object substrate to a predetermined depth therein.

4,592,794

GLASS BONDING METHOD

Earl K. Davis, Tempe; James E. Drye, and David J. Reed, both of Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 614,573, May 25, 1984, Pat. No. 4,515,898, which is a continuation-in-part of Ser. No. 298,435, Sep. 1, 1981, abandoned. This application Jan. 29, 1985, Ser. No. 696,219
Int. Cl.[4] B32B *31/06, 31/20*
U.S. Cl. 156—89 16 Claims



1. A method for bonding a ductile foil having a predetermined foil melting temperature to a ceramic base comprising:

providing a ceramic base of predetermined base coefficient of expansion and base melting temperature;

locating said ductile foil above said ceramic base;

placing a substantially alkali-free bonding glass between said foil and said ceramic base to form an assembly, said bonding glass having a predetermined glass softening temperature less than said foil and base melting temperatures and a predetermined glass coefficient of expansion, wherein said glass coefficient of expansion is smaller than said base coefficient of expansion;

wherein said bonding glass comprises ingredients by weight percent in the range of SiO_2 (10–15%), PbO (45–55%), ZnO (8–12%), Al_2O_3 (2–5%), and B_2O_3 (25–30%); and

applying heat and pressure to said assembly, said heat being sufficient to raise the temperature of said assembly so as to be in a range greater than said glass softening temperature, but less than said foil and base melting temperatures, and said pressure being sufficient to cause plastic flow of said glass to substantially eliminate voids between said base and said foil.

4,592,795

NON-EDIBLE, REINFORCED AMYLOSE AND AMYLOSE STARCH FOOD CASINGS

Douglas J. Bridgeford, Champaign, Ill., assignor to Inc. Teepak, Oak Brook, Ill.

Filed Nov. 26, 1984, Ser. No. 675,092
Int. Cl.[4] B44D *1/52*
U.S. Cl. 156—203 40 Claims

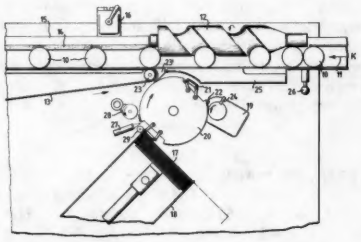
1. A high wet strength food wrapping which comprises a fibrous reinforcement impregnated with a continuous cross-linked matrix comprising a high amylose-containing amylomaceous material, said food wrapping remaining substantially flexible with aging.

4,592,796

DEVICE FOR THE APPLICATION OF LABELS TO CYLINDRICAL CONTAINERS

Ernst Schlacht, Berlin, Fed. Rep. of Germany, assignor to Weiss Etikettiertechnik GmbH + Co. KG, Berlin, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,331
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3345126
Int. Cl.[4] B65C *9/06, 9/16*
U.S. Cl. 156—450 7 Claims

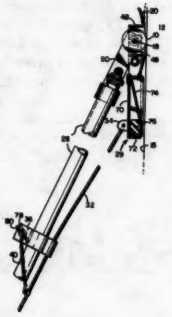


1. A device for the application of labels to cylindrical containers, comprising conveying means for advancing cylindrical containers to a work position; separating means for positioning the cylindrical containers at equal intervals from each other on said conveying means; drive means and counter surface means positioned opposite to the drive means and rolling said containers which are received from said conveying means at the work position; a gluing mechanism; label-containing box means; and a rotary label-transmitting drum positioned against said box means for removing an uppermost label from said box and transmitting said label along a periphery of the drum to said drive means and said counter surface means, said label-transmitting drum including at least one movable gripping segment which receives cold glue from said gluing mechanism and, upon the rotation of said drum, comes into contact with a front end of the uppermost label and takes said front end along upon a further rotation of the drum, and at least one stationary gripping segment which receives cold glue from said gluing mechanism and, upon rotation of said drum, comes into contact with a rear end of the uppermost label, said drum further including cam control means having a cam roller and a cam groove for guiding said cam roller, said cam control means controlling the movement of said movable segment when the latter is positioned against the front end of the uppermost label.

4,592,797
TOOL FOR FINISHING TAPED DRY WALL JOINTS

Carl Carlson, 2839 Eddington Ave., Bensalem, Pa. 19020

Filed Jul. 16, 1985, Ser. No. 755,475
Int. Cl.[4] B05C *17/02, 17/10*
U.S. Cl. 156—574 14 Claims



1. A tool for finishing joints in wallboard comprising:
a generally cylindrical roller for applying pressure to tape to embed it in adhesive;
a yoke rotatably supporting the roller at spaced locations along the roller axis;
a handle connected to the yoke for applying pressure to the roller when against a wall;
an adhesive trowel member for redistributing adhesive having an opening through which the roller projects and positioned generally tangent to but slightly below the roller surface, the trowel member presenting a curved surface of much greater radius than the roller;
a box scraper rotatably supported from the yoke about an axis parallel to the roller axis having a base and sidewalls except on the side adjacent the roller which is left open to accumulate adhesive scraped off the wall, said side walls terminating in a common plane permitting flat contact with the wall and act as a scraper to collect adhesive in the box; and
a separate scraper actuating means adjacent the handle connected to the box scraper and enabling the box scraper to be manually moved into place against a wall trailing the roller as the roller moves along a joint.

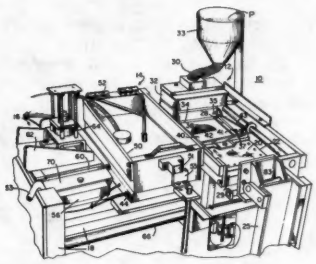
4,592,798
LINEAR DEPOSITION APPARATUS

Robert C. Simmonds, Jr., Topsfield; Andrew J. Gilbride, Swampscott, and Albert I. Morse, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 452,964, Dec. 29, 1982, abandoned.
This application May 2, 1985, Ser. No. 729,897
Int. Cl.[4] B31F *15/10*
U.S. Cl. 156—578 11 Claims

1. A machine for depositing a fused configuration of powder on a substrate comprising:
a frame member;
a receiving surface movable with respect to said frame member;
a material deposition means arranged over said receiving surface so as to supply said powdered material to said receiving surface;
a cut-out arranged in said deposition means to permit a quantified configuration of said powdered material to be deposited on said receiving surface;
a heating member disposed adjacent to said deposition means in said frame member, to heat said movable receiving surface with said powdered configuration thereon; and
a press station having said substrate arranged in a holder with respect thereto, said press stations receiving said held substrate on a slide arrangement.

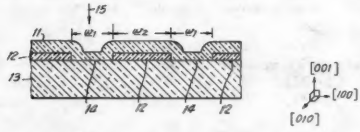
10. A machine for manufacturing a fused configuration of powder, which fused configuration will be applicable to a substrate, said machine comprising:
a frame member;
a receiving surface movable with respect to said frame member;
a material deposition means arranged over said receiving surface so as to supply said powdered material to said receiving surface;
a cut-out arranged in said deposition means to permit a quantified configuration of said powder to be deposed on said receiving surface;
a heating member disposed adjacent to said deposition means in said frame member, to heat said movable receiving surface and said powdered configuration thereon; and
a press station having a cooling means thereat for cooling said configuration of fused powder on said receiving surface.



4,592,799
METHOD OF RECRYSTALLIZING A POLYCRYSTALLINE, AMORPHOUS OR SMALL GRAIN MATERIAL

Yoshinori Hayafuji, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,800
Int. Cl.[4] C30B *1/08*
U.S. Cl. 156—617 R 43 Claims



1. A method of recrystallizing a polycrystalline or amporphous upper layer extending over an electrically isolating layer on a single crystal semiconductor substrate comprising:
interrupting said isolating layer at seeding locations which are spaced apart in at least one direction and at which said upper layer comes into contact with said substrate;
directing onto said upper layer an electron beam of generally strip-shaped cross section which is focused at said upper layer into a fine impact line of intense energy, said impact line extending in a direction transverse to one of said at least one direction;
relatively displacing said substrate and electron beam in said one direction so that said impact line effects a scan of at least a portion of said upper layer in said one direction; and
controlling the speed of said scan so that

$v_s \leqq \omega_3/Y$

where v_s is said speed, ω_3 is the width of said impact line in said one direction and Y is the time required for said upper layer to return from a liquid state to a solid state after it has been melted by said electron beam, said upper layer undergoing zone melting at said impact line, whereby single crystals are grown by lateral epitaxial recrystallization of said upper layer from said seeding location.

4,592,800

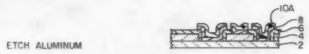
METHOD OF INHIBITING CORROSION AFTER ALUMINUM ETCHING

Richard F. Landau, Londonderry, and Henry A. Majewski, Nashua, both of N.H., assignors to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,901

Int. Cl.[4] C23F *1/02;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 21 Claims



1. In the fabrication of IC or other solid state semiconductor devices comprising (1) aluminum metallization and (2) plasma etching of aluminum involving use or formation of one or more of $SiCl_4$, Cl_2, and $AlCl_3$ and adsorption of one or more of said $SiCl_4$, Cl_2, and $AlCl_3$ species on surfaces of said devices or surfaces of substrates used in the fabrication of said devices, a process for inhibiting corrosion of aluminum layers formed by said metallization comprising: (a) exposing said devices or substrates to a gaseous non-plasma atmosphere comprising at least one substance that has a higher molecular weight than the adsorbed species of $SiCl_4$, Cl_2, and $AlCl_3$ and is non-reactive with aluminum in the presence of moisture, (b) continuing said exposure for a time and at a temperature sufficient to permit said at least one substance to displace substantially all of said adsorbed species, and (c) removing the said displaced species from contact with said devices or substrates.

4,592,801

METHOD OF PATTERNING THIN FILM

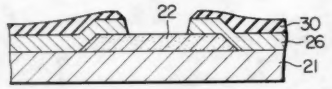
Shinichi Hara, Hitachi; Shinji Narishige, Mito; Tsuneo Yoshinari, Hitachi; Mistuo Sato, Takahagi; Katsuya Mitsuoka; Makoto Morijiri, both of Hitachi; Masanobu Hanazono, Mito, and Tetsuo Kobayashi, Kanagawa, all of Japan, assignors to Computer Basic Technology Research Association, Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,012

Claims priority, application Japan, Aug. 10, 1983, 58-144962

Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06;* C23F *1/02*

U.S. Cl. 156—643 23 Claims



1. A method of forming a thin film of a predetermined pattern on a desired surface having an uneven portion, comprising the steps of:

(a) forming a thin alumina film on the desired surface, including on the uneven portion;

(b) forming a photoresist film of a predetermined pattern on said thin alumina film, including on the uneven portion; and

(c) removing an exposed portion of said thin alumina film by an ion beam etching technique using a carbon fluoride gas, while using said photoresist film as a mask, wherein an ion accelerating voltage during the ion beam etching technique using a carbon fluoride gas is equal to or greater than 600 V.

4,592,802

METHOD OF FABRICATION OF ALUMINUM CONTACTS THROUGH A THICK INSULATING LAYER IN AN INTEGRATED CIRCUIT

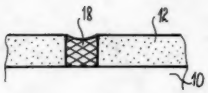
Simon Deleonibus, Grenoble, and Guy Dubois, St. Etienne de Crossey, both of France, assignors to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux E.F.C.I.S., Grenoble, France

Filed Apr. 10, 1985, Ser. No. 721,779

Claims priority, application France, Apr. 13, 1984, 84 05906

Int. Cl.[4] C23F *1/02;* B44C *1/22;* C03C *15/00;* H01L *21/306*

U.S. Cl. 156—644 3 Claims



1. A method of fabrication of an interconnection layer in an integrated circuit, comprising the steps which consist in depositing a relatively thick insulating layer on a substrate which incorporates integrated circuit elements already formed, etching a narrow contact opening in said layer, depositing by vacuum evaporation and etching an interconnection metal, wherein said method comprises, after etching of the narrow contact openings and prior to deposition by evaporation of the interconnection metal:

deposition by chemical decomposition in gas phase of a conductive material having a high covering power both on vertical substrate surfaces and on horizontal substrate surfaces, the deposition being performed to a sufficient depth to ensure that the entire volume of the narrow contact opening is filled with conductive material and to ensure that the thickness of said material opposite to said opening is distinctly greater than the thickness above the insulating layer;

etching of said material by vertical anisotropic etching to a uniform depth corresponding substantially to the thickness deposited over the entire surface of the insulating layer so as to remove the conductive material outside the opening while removing only a small proportion of said material within said opening.

4,592,803

DEVICE FOR MAKING ALKALI METAL PHOSPHATES BY SPRAYING ALKALI METAL PHOSPHATE SOLUTIONS OR SUSPENSIONS

Ben Damman, Middelburg; Jan Drijver, Vlissingen; Hans Kinneging, Middelburg; Hans Scheffer; Jaap Stam, both of Vlissingen, and Paul de Witte, Westkapelle, all of Netherlands, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 399,769, Jul. 19, 1982, Pat. No. 4,501,639. This application Nov. 20, 1984, Ser. No. 673,271

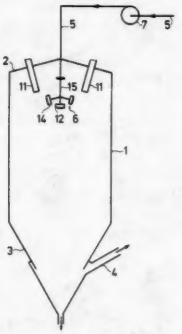
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129180

Int. Cl.[4] B01D *1/18;* C01B *25/30*

U.S. Cl. 159—4.02 5 Claims

1. A device for producing alkali metal phosphates and alkali metal polyphosphates, respectively, which comprises: a cylindrical spray tower having a tapered lower end and being closed by means of a cover, said cover being centrally penetrated by a solvent supply pipe; a plurality of burners being passed through the cover, concentrically with respect to the solvent supply pipe; at least one pressure-increasing pump

forming part of the solvent supply pipe; said solvent supply pipe being connected to a spray-inducing means; said spray-inducing means being arranged inside the spray tower comprising a feed pipe and a plurality of spray heads; a plurality of single opening nozzles having bores 0.5 up to 5 mm wide and



being installed in the terminal surface area of each spray head; and the terminal surface area of one spray head being directed downwardly, while the other spray heads being arranged above the first spray head having terminal surface areas inclined with respect to, and facing, the inside wall of the spray tower.

4,592,804

METHOD FOR PRE-TREATING LIGNOCELLULOSIC MATERIAL IN TWO STEAMING ZONES

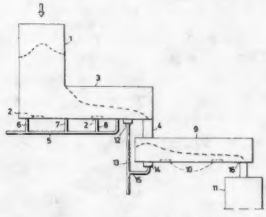
Sture Noréus; Hans Lundberg; Lars Uhlin, and Bengt Lindquist, all of Husum, Sweden, assignors to Mo och Domsjo AB, Ornskoldsvik, Sweden

Filed Jun. 21, 1984, Ser. No. 622,944

Claims priority, application Sweden, Jun. 27, 1983, 8303646-7

Int. Cl.⁴ D21C *1/02*

U.S. Cl. 162—19 **4 Claims**



1. A process for preheating particulate lignocellulosic material to prepare it for steaming followed by continuous chemical digestion by pulping liquor to form cellulose pulp, so as to ensure that the steamed lignocellulosic material is substantially free from air when brought into contact with the pulping liquor, which comprises:

(1) advancing a mass of particulate lignocellulosic material along a substantially horizontal plane through a first steaming zone;

(2) feeding steam from a plurality of substantially uniformly spaced locations into the mass within the first steaming zone in a manner to heat the lignocellulosic material uniformly throughout the mass;

(3) feeding the steam into the mass under such conditions that steam condenses on the material, and steam condensate descends by gravity through the mass to the bottom of the first steaming zone;

(4) collecting and removing from the bottom of the zone the steam condensate running off the particulate lignocellulosic material; and then

(5) while advancing the mass of particulate lignocellulosic material along a substantially horizontal plane through a second steaming zone steaming the material until the lignocellulosic material is substantially free from air.

4,592,805

SEPARATION OF N-PROPYL ACETATE FROM N-PROPANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Division of Ser. No. 624,339, Jun. 25, 1984. This application Dec. 14, 1984, Ser. No. 681,893

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.⁴ B01D *3/40*

U.S. Cl. 203—51 **4 Claims**

1. A method for recovering n-propyl acetate from a mixture of n-propyl acetate, n-propanol and water which comprises distilling a mixture of n-propyl acetate, n-propanol and water in a rectification column in the presence of about one part of extractive agent per part of n-propyl acetate—n-propanol—water mixture, recovering n-propyl acetate and water as overhead product and obtaining the extractive agent and n-propanol from the stillpot or reboiler, the extractive agent comprises acetamide.

3. A method for recovering n-propyl acetate from a mixture of n-propyl acetate, n-propanol and water which comprises distilling a mixture of n-propyl acetate, n-propanol and water in a rectification column in the presence of about one part of extractive agent per part of n-propyl acetate—n-propanol—water mixture, recovering n-propyl acetate and water as overhead product and obtaining the extractive agent and n-propanol from the stillpot or reboiler, the extractive agent comprises N,N-dimethylacetamide.

4,592,806

PROCESS FOR THE PRODUCTION OF GRADE AA METHANOL

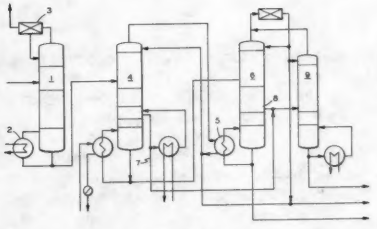
Hartmut Ilgner; Natarajan Thiagarajan, both of Dortmund; Günter Heck, Wiesbaden, and Aladar Lienerth, Kelkheim, all of Fed. Rep. of Germany, assignors to Uhde GmbH, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,287

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311316

Int. Cl.⁴ B01D *3/14*

U.S. Cl. 203—71 **5 Claims**



1. In a method of making Grade AA methanol having a maximum ethanol content of 10 ppm, the method including feeding crude methanol to a first topping distillation column, and using a second distillation column and a third distillation column, in which each of the columns has an intermediate

stripping section and the Grade AA methanol being withdrawn from the top level of each of the second and third distillation columns, the improvement comprising removing fusel oil containing methanol from the stripping section of the second column and the stripping section of the third column, and feeding the fusel oil from the second and third columns to a fourth distillation column to recover additional Grade AA methanol from the fusel oil to thereby increase the overall yield Grade AA methanol and distilling the fusel oil at a reflux ratio of at least 5:1 to provide additional methanol product to reduce the methanol loses from about 1.5% to as low as 0.2%.

4,592,807

METHODS OF MAKING HIGHLY CONDUCTIVE PHOTOELECTROCHEMICAL ELECTRODES

Jay A. Switzer, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 496,284, May 19, 1983, Pat. No. 4,521,499. This application Mar. 13, 1985, Ser. No. 711,354

Int. Cl.[4] C25D *9/04*

U.S. Cl. 204—2.1 **51 Claims**

1. A method for preparation of a photoelectrode comprising the step of photoelectrochemical deposition of a conductive coating material having a band gap from greater than 0 to about 3.0 e.V. on a substrate consisting essentially of a semiconductor selected from the group consisting of n-type, p-type, and intrinsic semiconductors.

4,592,808

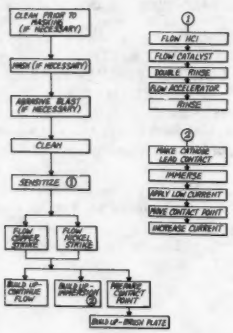
METHOD FOR PLATING CONDUCTIVE PLASTICS

Roark M. Doubt, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 537,497, Sep. 30, 1983, abandoned. This application Jul. 24, 1984, Ser. No. 633,802

Int. Cl.[4] C25D *5/56;* B05D *3/10, 3/12*

U.S. Cl. 204—20 **18 Claims**



1. A method of plating metal onto conductive plastic, comprising:

cleaning the area to be plated with a cleaning solution that will not appreciably attack the plastic;

sensitizing said area to provide a base for firm adhesion of the metal to be electrolessly plated onto the plastic, including flowing a catalyst solution over said area at a velocity sufficiently low to allow the catalyst solution to act on said area effectively and evenly and flowing an accelerator solution over said area at a velocity sufficiently low to allow the accelerator solution to act on said area effectively and evenly;

striking said area by flowing an electroless plating solution over said area at a velocity sufficiently low to allow metal in the plating solution to plate evenly onto said area and keeping said area wet with such plating solution until said area is essentially completely covered; and

plating said area to the desired thickness.

4,592,809

ELECTROPLATING COMPOSITION AND PROCESS AND SURFACTANT COMPOUND FOR USE THEREIN

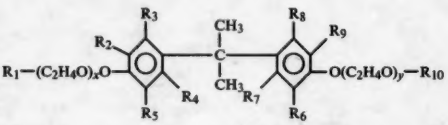
Jaan J. Fong, Woodbury, Minn., and Donald H. Becking, Southington, Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Aug. 6, 1985, Ser. No. 762,940

Int. Cl.[4] C07C *143/38;* C25D *3/22, 3/56*

U.S. Cl. 204—44.2 **35 Claims**

1. A compound represented by the formula:



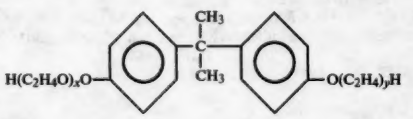
wherein:

x and y are integers from 1 to 39, and the sum of x+y is from 2 to 78;

R_1 through R_{10} and H or SO_3X, with the proviso that at least one of R_1 through R_{10} must be SO_3X,

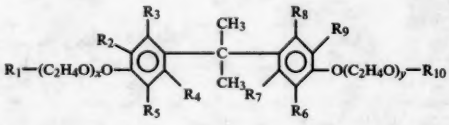
and X is any monovalent cation.

9. A method for preparing a surfactant useful in electroplating process, comprising contacting under reaction conditions an ethoxylated bisphenol of the formula:



wherein x and y are integers from 1 to 39 and the sum of x+y is from 2 to 78, with a material selected from the group consisting of sulfamic acid, sulfuric acid and chlorosulfonic acid.

14. A composition for electroplating metal onto a substrate therefor, comprising an aqueous admixture of a soluble source of metal ion; a soluble electrolyte and, as a surfactant, a compound of the formula:



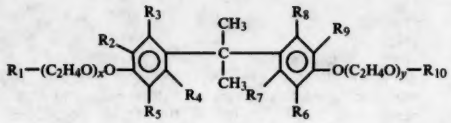
wherein:

x and y are integers from 1 to 39, and the sum of x+y is from 2 to 78;

R_1 through R_{10} are H or SO_3X, with the proviso that at least one of R_1 through R_{10} must be SO_3X; and

X is any monovalent cation.

23. A composition for electroplating zinc or an alloy thereof onto a substrate therefor, comprising an aqueous admixture of a soluble source of zinc; a soluble electrolyte; and, as a surfactant, a compound of the formula:



wherein:

x and y are integers from 1 to 39, and the sum of x + y is from 2 to 78;

R_1 through R_{10} are H or SO_3X, with the proviso that at least one of R_1 through R_{10} must be SO_3X; and

X is any monovalent cation.

4,592,810

ELECTROCATALYTIC PRODUCTION OF 2,3,5,6-TETRACHLOROPYRIDINE FROM PENTACHLOROPYRIDINE

Charles K. Bon, Concord; Arthur J. Kamp, Oakley, and Theodore J. Sobieralski, Antioch, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1985, Ser. No. 712,936

Int. Cl.⁴ C07D *213/61*

U.S. Cl. 204—59 R **11 Claims**

1. The method of preparing 2,3,5,6-tetrachloropyridine which comprises electrocatalytically reducing pentachloropyridine at a cathode immersed in a catholyte comprising a solution of the pentachlorpyridine, water and $ZnCl_2$ or $ZnBr_2$ in a solvent which is or has the essential characteristics of acetonitrile.

4,592,811

ELECTROLYTIC CELL COMPRISING STAINLESS STEEL ANODE, BASIC AQUEOUS ELECTROLYTE AND A CATHODE AT WHICH TETRACHLORO-2-PICOLINATE IONS CAN BE SELECTIVELY REDUCED IN HIGH YIELD TO 3,6-DICHLOROPICOLINATE IONS

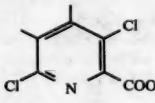
Demetrios Kyriacou, Salonica, Greece, and Donald N. Brattesani, Oakland, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 305,822, Sep. 28, 1981, Pat. No. 4,533,454. This application Apr. 8, 1985, Ser. No. 720,766

Int. Cl.⁴ C07B *29/06*

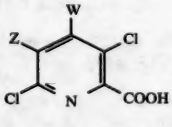
U.S. Cl. 204—73 R **2 Claims**

1. The process for the co-production of oxygen and polychloropicolinate anions of the structure



(A)

which comprises providing a solution in an aqueous base of a polychloropicolinic acid of the structure



(B)

wherein

both Z and W are Cl or one is Cl and the other is H, and, while agitating said solution, passing an electric current therethrough from an anode to a cathode,

said solution having a temperature within the range of from about 5° to about 60° C., a pH of about 13 or more and containing at least 0.08 hydroxyl ions per Cl^- ion present therein,

said cathode

(a) being one at which tetrachloro-2-picolinate anions in basic, aqueous solution can be reduced to 3,6-dichloropicolinate anions in a yield of at least 90 mole %, and

(b) having a potential relative to a saturated calomel electrode of from about −0.8 to about −1.8

said anode

(1) being a stainless steel anode, and

(2) having a potential, relative to said cathode, such that the density of said current is from about 0.005 to about 0.085 amperes per cm^2 of projected cathode surface,

thereby forming anions of said polychloropicolinic acid (A) at said cathode and oxygen at said anode.

4,592,812

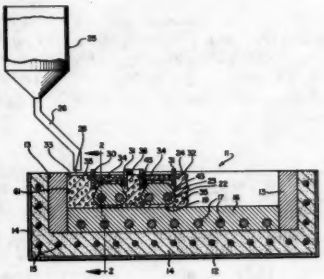
METHOD AND APPARATUS FOR ELECTROLYTIC REDUCTION OF ALUMINA

Theodore R. Beck, and Richard J. Brooks, both of Seattle, Wash., assignors to Electrochemical Technology Corp. and Brooks Rand, Ltd., both of Seattle, Wash.

Filed Oct. 25, 1984, Ser. No. 664,497

Int. Cl.⁴ C25C *3/06, 3/08*

U.S. Cl. 204—67 **29 Claims**



1. A method for reducing alumina to aluminum, employing an electrolytic cell, said method comprising the steps of:

providing said cell with a molten electrolyte bath composed of halide salts having a density greater than that of aluminum and less than that of alumina, said bath having a top surface;

providing a solid, non-consumable anode at the bottom of said bath;

providing a plurality of cathodes each having a cathode bottom spaced above said anode below the top surface of said bath;

introducing into said bath alumina particles devoid of carbonaceous material;

passing an electric current through said bath from said anode to said cathodes;

forming gaseous oxygen at said anode;

bubbling said gaseous oxygen formed at said anode upwardly therefrom, through said bath, to agitate the bath so as to enhance the dissolution of alumina in that part of the bath adjacent the anode to obtain substantial saturation of that part of said bath with dissolved alumina and so as to inhibit substantially alumina particles in the bath from settling on said anode;

forming metallic aluminum at said cathode;

said method being devoid of any expedient for maintaining said particles on the anode at the bottom of the bath;

and accumulating molten aluminum at a location atop said bath;

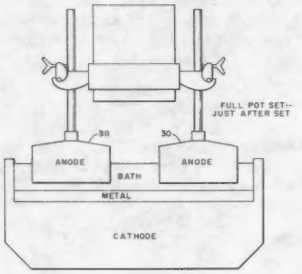
said method being performed without the employment of a carbon-containing reducing agent in said cell.

4,592,813

FULL POT ANODE CHANGE IN THE PRODUCTION OF ALUMINUM

George H. Henry, Newburgh, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 16, 1985, Ser. No. 723,830
Int. Cl.[4] C25C *3/06*
U.S. Cl. 204—67 **9 Claims**



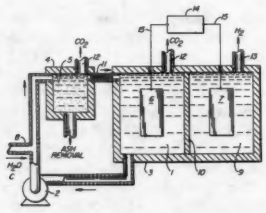
1. In a process for producing aluminum by electrolysis of alumina dissolved in a cryolite-based molten salt contained between a cathode and a plurality of previously baked carbon anodes which are consumed with evolution of oxides of carbon, the improvement comprising replacing all anodes at the same time.

4,592,814

ELECTROCHEMICAL SYNTHESIS OF HUMIC ACID AND OTHER PARTIALLY OXIDIZED CARBONACEOUS MATERIALS

Ronald J. Vaughan, deceased, late of Orinda, and by Bank of America NT&SA, administrator, Walnut Creek, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 496,799, May 23, 1983, abandoned. This application Sep. 21, 1984, Ser. No. 653,664
The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.
Int. Cl.[4] C25B *3/02*
U.S. Cl. 204—78 **9 Claims**



1. A method for the partial oxidation of carbonaceous materials which comprises the steps:

(a) passing an aqueous acidic electrolyte solution of pH 3 or less containing iron (II) ions to an electrolytic cell comprising a cathode and an anode;

(b) passing a direct current through said solution, thereby anodically oxidizing at least a portion of said iron (II) to iron (III) ions with generation of hydrogen at said cathode;

(c) passing said hydrogen and said iron (III) ions from the cell;

(d) reducing the iron (III) ion oxidation product in the aqueous acidic electrolyte to iron (II) ions by contacting the same with a solid carbonaceous reducing agent at a temperature in the range of from 100° C. to 200° C. and wherein the particle size of said solid carbonaceous reducing agent is from 1 to 150 microns; and

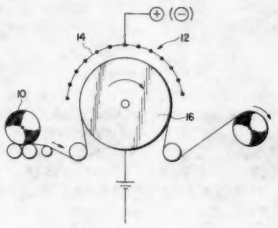
(e) recycling at least a portion of the aqueous acidic electrolyte containing the iron (II) ions from step (d) to step (a) until sufficient current has been passed through the cell to elevate the oxygen level of the carbonaceous material to between about 10% and 40% and with the proviso that the total iron concentration as either iron (II) and/or iron (III) ions in said aqueous acidic electrolyte is from about 0.05 to 0.5 molar.

4,592,815

METHOD OF MANUFACTURING AN ELECTRET FILTER

Etsuro Nakao, Motiyama, Japan, assignor to Japan Vilene Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,789
Claims priority, application Japan, Feb. 10, 1984, 59-23678
Int. Cl.[4] C07C *3/24;* **B29C** *35/02*
U.S. Cl. 204—165 **15 Claims**



1. A method of manufacturing electret filters comprising:

providing a preformed non-woven fabric of non-polar synthetic polymer fibers having an intrinsic viscosity of 1.5 or less;

providing a ground electrode and at least one discharge electrode adjacent said ground electrode and establishing a high voltage field therebetween;

passing said preformed non-woven fiber fabric through the high voltage field while in contact with the ground electrode to impart a permanent electrostatic charge to said fabric, said fabric remaining at approximately room temperature as it passes through the high voltage field.

4,592,816

ELECTROPHORETIC DEPOSITION PROCESS

William D. Emmons, Huntingdon Valley, and Mark R. Winkle, Lansdale, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 26, 1984, Ser. No. 654,821
Int. Cl.[4] C25D *13/06, 13/12, 13/20*
U.S. Cl. 204—180.6 **4 Claims**

3. A cataphoretic process for forming a negative image on a conductive surface comprising:

(a) utilizing said conductive surface as the cathode and an inert material as an anode to form a electrolytic cell;

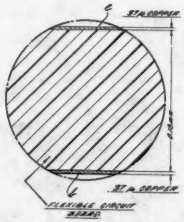
(b) immersing said cathode and said anode in a photosensitive polymer composition comprising an aqueous solution or emulsion of at least one polymer free of ethylenic unstauration and having positively charged carrier

groups, a photoinitiator and a unsaturated crosslinking monomer;

(c) completing the electrolytic circuit by connecting the anode and cathode to a direct current voltage source;

(d) applying a potential across the anode, cathode and polymeric solution or emulsion until said current is decreased to less than about 15 percent of the initial current to coat said cathode;

(e) discontinuing the applied potential and removing said coated cathode from said cell;



(f) exposing portions of said coated cathode to a source of actinic radiation; and

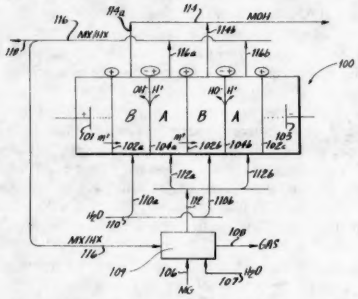
(g) developing the unexposed portions of said coated cathode using an aqueous solution of an organic acid to form a negative crosslinked polymer image on said surface, said image being resistant to etchants or plating solutions but capable of being stripped from said cathode surface using an aqueous solution.

4,592,817

ELECTRODIALYTIC WATER SPLITTING PROCESS FOR GASEOUS PRODUCTS

Frederick P. Chlanda, Rockaway, and Krishnamurthy N. Mani, Denville, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 3, 1984, Ser. No. 676,609
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 **20 Claims**



1. A process which comprises the steps of:

contacting a material comprising a salt of a first acid with a hydrogen ion-enriched aqueous solution comprising a second acid to produce a product solution comprising the first acid and a salt of the second acid, and being substantially free of the salt of the first acid;

feeding at least a portion of the product solution to an electrodialytic water splitter and generating therein the hydrogen ion-enriched aqueous solution comprising the second acid;

withdrawing the hydrogen ion-enriched aqueous solution comprising the second acid from the electrodialytic water splitter; and,

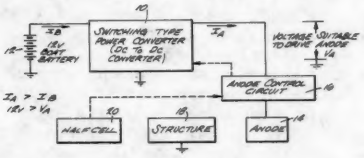
supplying at least portion thereof for contact with material comprising the salt of the first acid.

4,592,818

CATHODIC PROTECTION SYSTEM

David T. Cavil, Menomonee Falls, and William R. Krueger, West Allis, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 12, 1983, Ser. No. 531,420
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—196 **14 Claims**



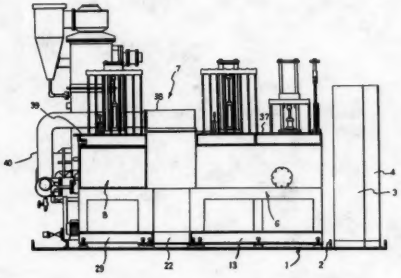
10. An impressed current cathodic protection system comprising an object to be protected, and a cathodic protection circuit connected to said object and including an anode, a battery, and means including a switching type dc-to-dc power converter connected between the battery and the anode for supplying more current and less voltage to the anode than taken from the battery.

4,592,819

ELECTROPLATING APPARATUS WITH VENTILATION MEANS

Toshiyuki Suzuki, Hamakita, and Hiroshi Tsukakoshi, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 354,180, Mar. 3, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 707,176
Claims priority, application Japan, Mar. 3, 1981, 56-30086
Int. Cl.[4] C25D *5/00, 17/00*
U.S. Cl. 204—203 **2 Claims**



1. An electroplating apparatus with ventilating means comprising:

a plurality of tanks arranged in a sequential series partitioned into a pretreating section, an electroplating section and a post-treating section;

conveying means conveying workpieces consecutively through said plurality of tanks from one section to another;

said electroplating section comprising smaller confined chambers displaced perpendicular to the path of said conveying means;

holding means for holding and transferring said workpieces

consecutively from said conveying means to said electroplating section and back to said conveying means;

cover means covering said plurality of tanks and said conveyor means;

inlet means at one end of said cover means providing an inlet to said pretreating section, said inlet being open to ambient air;

outlet means at a second end opposite said one end providing an outlet for plating workpieces, said outlet being open to ambient air;

circulating means continuously circulating electroplating liquids through the smaller confined chambers of said electroplating section;

duct means connecting the enclosure formed by said cover means with the atmosphere outside the work area remote from said electroplating apparatus;

an exhaust fan interposed in said duct means for exhausting accumulated fumes from said covered enclosure and said plating liquid tank to said atmosphere;

filter means between said cover enclosure and enclosed tank for filtering accumulated gases before discharge by said exhaust fan.

whereby a compact, high-speed in-line fully ventilated electroplating system is provided in which air is drawn into said plating apparatus through said inlet and outlet means over said pretreating, electroplating and post-treating sections by said exhaust fan for discharge through said duct means.

4,592,820

ELECTROLYTIC REDUCTION CELLS FOR ALUMINIUM PRODUCTION

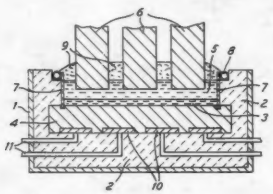
James P. McGeer, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 680,906, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 497,726, May 24, 1983, abandoned. This application Sep. 12, 1985, Ser. No. 775,735

Claims priority, application United Kingdom, May 28, 1982, 8215728

Int. Cl.[4] **C25C** *3/08;* **C25B** *11/12*

U.S. Cl. 204—243 R **7 Claims**



1. An electroytic reduction cell for the production of aluminium by reduction of alumina in a molten fluoride electrolyte having floor and side walls constructed of material resistant to attack by molten aluminium, the side walls being lined at least in part with ceramic material selected from the class consisting of borides, nitrides and oxynitrides resistant to attack by the cell electrolyte and by molten aluminium, and being provided with thermal insulation to an extent such that a layer of solidified electrolyte is not present thereon during normal operation of the cell, the cell having a cathode current collection system arranged in such manner that the horizontal lateral currents in the cathode are insignificant compared with the vertical current, said ceramic material being used in the form of tiles or panels at least 0.5 cm thick.

4,592,821

ELECTROLYSIS TANK WITH A CURRENT STRENGTH OF GREATER THAN 250,000 AMPERES FOR THE PRODUCTION OF ALUMINUM BY MEANS OF THE HALL-HEROULT PROCESS

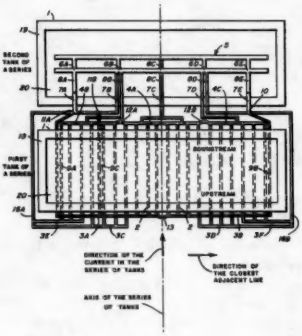
Maurice Keinborg, Saint Ismier; Bernard Langon, and Joseph Chaffy, both of Saint Jean de Maurienne, all of France, assignors to Aluminium Pechiney, Paris, France

Filed Oct. 2, 1984, Ser. No. 656,852

Claims priority, application France, Oct. 4, 1983, 83 16048

Int. Cl.[4] **C25C** *3/00*

U.S. Cl. 204—244 **8 Claims**



1. Apparatus for the production of aluminium by the electrolysis of alumina dissolved in fused cryolite using the Hall-Heroult process, with a current strength of between 270,000 amperes and 320,000 amperes, with a level of energy consumption of less than 12,600 kWh per tonne of aluminium produced, said apparatus comprising a plurality of aligned rectangular tanks whose small sides are referred to as 'heads', being disposed crosswise with respect to their axis of alignment and being electrically connected in series as a single line or a plurality of parallel lines, each tank comprising a steel casing lined with insulating material and supporting a cathode formed by a plurality of juxtaposed carbonaceous blocks into which are sealed metal cathodic bars (2) connected to a plurality of upstream (3) and downstream (4) cathodic collectors, a plurality of prebaked carbonaceous paste anodes into which are sealed the metal anode rods, an anodic bus bar (5) which is movable upwardly and downwardly and on to which the anode rods are fixed, and electrical connecting means (16) between the upstream and downstream cathodic collectors (3 and 4 respectively) of a tank, on the one hand, and the anodic bus bar (5) of the following tank in the series, on the other hand, in which apparatus the anodic bus bar (5) of each tank is connected to the preceding tank at five points (6A, 6B, 6C, 6D and 6E) by five equally spaced risers disposed on its upstream side (8), characterised in that:

the connection between each riser (7) and the anodic bus bar (5) is made by flexible electrical conductors (8),

the central riser (7C) which is disposed on the axis of the series, the two intermediate risers (7B, 7D) and the two lateral risers (7A, 7E) through which substantially equal current strengths pass are connected to six upstream cathodic collectors (3), two central connectors (3A, 3B), two intermediate collectors (3C, 3D) and two lateral collectors (3E, 3F) and three downstream cathodic collectors (4), a central collector (4A) and two lateral collectors (4B, 4C),

the downstream cathodic collectors (4A, 4B and 4C) are connected together by equipotential connections formed by flexible conductors, and

the central upstream cathodic collectors (3A and 3B) are

also connected together by an equipotential connection formed by flexible conductors.

4,592,822

ELECTROLYSIS CELL

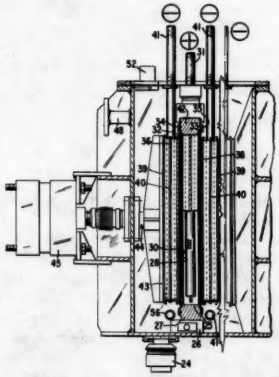
Oronzio deNora, Milan, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation of Ser. No. 619,014, Jun. 11, 1984, abandoned, which is a division of Ser. No. 561,554, Oct. 13, 1983, Pat. No. 4,536,263, which is a division of Ser. No. 382,670, May 27, 1982, which is a division of Ser. No. 151,695, May 20, 1980, Pat. No. 4,341,604, which is a continuation-in-part of Ser. No. 57,255, Jul. 12, 1979, Pat. No. 4,343,689. This application Oct. 23, 1985, Ser. No. 790,328

Claims priority, application Italy, Jul. 27, 1978, 26171 A/78

Int. Cl.[4] C25B *9/00, 11/03, 11/10*

U.S. Cl. 204—252 9 Claims



1. In a cation exchange membrane type electrolysis cell provided with at least one set of anode and cathode separated by a cation exchange membrane capable of transmitting cations therethrough but impermeable to the flow of electrolyte, the improvement comprising at least said anode being an electrode structure consisting essentially of a planar coarse mesh metal current distributor screen and a thin fine mesh metal screen having an electrocatalytic surface and disposed on the surface of the coarse metal current distributor and in electrical contact therewith, said fine mesh screen directly facing the membrane.

4,592,823

FLUSHABLE REFERENCE CELL FOR POTENTIOMETRIC MEASUREMENTS

Walter J. Gregory, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 15, 1985, Ser. No. 765,745

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—409 9 Claims

1. A flushable electrochemical reference cell comprising, in combination:

a first tubular standard electrolyte-containing compartment having an ion permeable member defining a first junction adapted for contact, exteriorly thereof, with a sample solution;

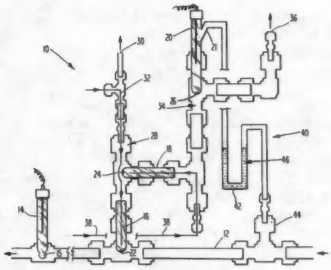
a second tubular, standard electrolyte-containing compartment having an ion permeable member defining a second junction adapted for contact, exteriorly thereof, with the standard electrolyte contained in the first tubular compartment;

a third tubular, standard electrolyte and standard electrode-containing compartment having an ion permeable member defining a third junction adapted for contact, exteriorly thereof, with the standard electrolyte contained in the second tubular compartment, the third tubular compartment including a conductor for electrical contact between the electrode and a potentiometer;

first fluid conducting means between the interior of the first tubular compartment and the exterior of the second tubular compartment;

second fluid conducting means between the interior of the second tubular compartment and the exterior of the third tubular compartment;

a first fluid conduit positioned to deliver a first flushing liquid to the first junction interiorly of the first tubular



compartment, and to the second junction exteriorly of the second tubular compartment;

first exit means for removal of the first flushing liquid;

a second fluid conduit positioned to deliver a second flushing liquid to the second junction interiorly of the second tubular compartment, and to the third junction exteriorly of the the third tubular compartment; and

second exit means for removal of the second flushing liquid.

6. The reference cell of claim 1 wherein the sample solution comprises a moving stream, and said cell further including fluid pressure equalizing means between the moving stream and the electrolyte in the third tubular compartment.

4,592,824

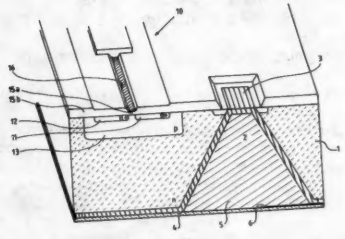
MINIATURE LIQUID JUNCTION REFERENCE ELECTRODE AND AN INTEGRATED SOLID STATE ELECTROCHEMICAL SENSOR INCLUDING THE SAME

Rosemary L. Smith, Neuchâtel, Switzerland, and Scott Collins, Ogden, Utah, assignors to Centre Suisse d'Electronique et de Microtechnique S.A., Neuchâtel, Switzerland

Filed Sep. 13, 1985, Ser. No. 775,769

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—416 8 Claims



1. A miniature reference electrode providing both electrical connection and a liquid junction between a reference liquid solution and a solution to be tested, comprising:

a substrate provided with a cavity to hold said reference liquid solution;

a membrane comprising porous silicon closing a first end of said cavity;

means for applying fixed control voltage to said reference liquid solution; and

means for hermetically closing a second end of said cavity.

7. An integrated chemical sensor including an Ion Sensitive Field Effect Transistor formed in a silicon substrate and a miniature reference electrode on said silicon substrate, wherein said electrode comprises:

a cavity provided in said silicon substrate to hold a reference liquid solutiion;

a membrane comprising porous silicon, said membrane closing a first end of said cavity;

means for applying a fixed control voltage to said reference liquid solution; and

means for hermetically closing a second end of said cavity.

4,592,825

PROBE FOR MEASURING OXYGEN PARTIAL PRESSURE IN A GAS ATMOSPHERE

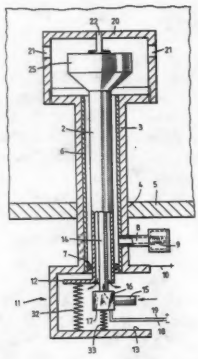
Térésa Crevoiserat, 2944 Bonfol, Switzerland

Continuation of Ser. No. 573,314, Jan. 24, 1984, abandoned. This application Aug. 23, 1985, Ser. No. 768,182

Claims priority, application Switzerland, Feb. 4, 1983, 652/83

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—426 **14 Claims**



1. A probe for measuring the oxygen partial pressure in a gaseous atmosphere as compared with a reference atmosphere, comprising:

a tablet of solid electrolyte having a first face exposed to the gaseous atmosphere and a second face exposed to the reference atmosphere;

a tubular support releasably bearing against said tablet and separating said gaseous atmosphere from said reference atmosphere;

a measuring electrode in contact with a central zone of said first face of said tablet;

a reference electrode in contact with a central zone of said second face of said tablet;

an annular seat surface at one end of said tubular support for sealably engaging a peripheral zone of said second face;

a holding support for holding said measuring electrode in contact with said central zone of said first face; and

means co-acting between said holding support and said tubular support for urging said measuring electrode against only said central zone of said first face and said peripheral zone of said second face against said annular seat, thereby simultaneously providing a releasably sealed connection between said tablet and said tubular support and an electrical contact between said central zone of said first face and said measuring electrode within said gaseous atmosphere the contact between said measuring electrode and said central zone being the sole area where pressure is transmitted between the holding support and the first surface of the tablet.

4,592,826

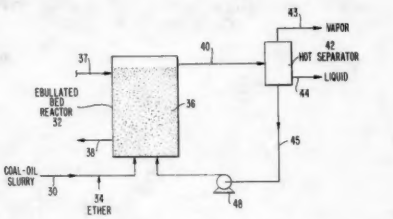
USE OF ETHERS IN THERMAL CRACKING

Partha S. Ganguli, Lawrenceville, N.J., assignor to HRI, Inc., Gibbsboro, N.J.

Filed Apr. 13, 1984, Ser. No. 600,067

Int. Cl.[4] C10G *1/00, 9/00*

U.S. Cl. 208—407 **12 Claims**



1. A non-catalytic process for upgrading hydrocarbon materials to produce lower boiling hydrocarbon liquid products, comprising the steps of:

(a) preheating a hydrocarbon feed material to a temperature of 600°–700° F.;

(b) passing the hydrocarbon feed material through a reaction zone at a temperature of 750°–900° F. and a pressure of between about 200 to about 1000 psi, thermally cracking the hydrocarbon feed material, and forming free radicals therein;

(c) injecting an ether material into the stream of hydrocarbon material in the reaction zone and forming ether free radicals therein; and

(d) reacting the free radicals formed from the ether material with those free radicals formed from the hydrocarbon material in the reaction zone to produce lower boiling hydrocarbon products.

4,592,827

HYDROCONVERSION OF HEAVY CRUDES WITH HIGH METAL AND ASPHALTENE CONTENT IN THE PRESENCE OF SOLUBLE METALLIC COMPOUNDS AND WATER

Roberto Galiasso, San Antonio de Los Altos; Jose A. Salazar, Edo. Miranda; Alfredo Morales, San Antonio de Los Altos, and Angel R. Carrasquel, Edo. Miranda, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 461,891, Jan. 28, 1983, abandoned. This application Jun. 25, 1985, Ser. No. 748,493

Int. Cl.[4] C10G *47/04, 65/10, 65/12, 67/04*

U.S. Cl. 208—59 **18 Claims**

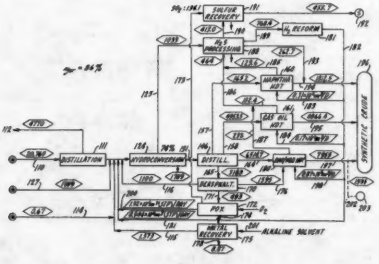
1. A thermal hydroconversion process for a hydrocarbon feedstock containing asphaltenes and metals which comprises the steps of

(a) combining said feedstock with water, with a metallic catalyst precursor soluble in the feedstock and containing a metal catalyst which is a member of the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Pericdic Table of Elements, and with a liquid recycle stream containing said metal catalyst in an amount of about 400 to about 15000 parts of said metal catalyst per million parts by weight of said recycle stream to produce a liquid admixture; said water being added to the resulting liquid admixture in an amount of about 0.1 to about 20 volume percent, based on the volume

of the feedstock, and said metallic catalyst precursor being present in an amount providing about 50 to about 1000 parts of said metal catalyst per million parts by weight of said feedstock;

(b) pre-heating the resulting admixture to a temperature of at least about 230° C. but no more than about 420° C. for a time period sufficient to effect decomposition of the metallic catalyst precursor present;

(c) introducing hydrogen into the pre-heated admixture and subjecting the resulting mixture to thermal hydroconversion



at a temperature of about 420° C. to about 540° C. and at a pressure of about 20 to about 250 atmospheres for a time period sufficient to provide an upgraded hydrocarbon mixture, and while maintaining a liquid water concentration in the resulting mixture of about 2 to about 25 percent by volume, based on the volume of the feedstock;

(d) fractionating the upgraded hydrocarbon mixture to produce at least one vapor phase fraction and a residue fraction containing said metal catalyst; and

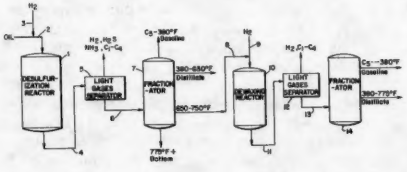
(e) recycling at least a portion of the residue fraction to step (a), above.

4,592,828

PROCESS FOR UPGRADING PETROLEUM RESIDUA

Yung F. Chu, and Stuart S. Shih, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1984, Ser. No. 607,373
Int. Cl.[4] C10G *65/04, 65/12*
U.S. Cl. 208—89 **15 Claims**



1. In a process for catalytically desulfurizing a petroleum residua feedstock and subsequently catalytically dewaxing the desulfurized feedstock with a shape selective zeolite catalyst, the improvement comprising: separating a fraction having a boiling range of about 650°–775° F. from the distillate product formed by desulfurization and dewaxing said separated fraction alone by contacting said fraction with a shape selective zeolite catalyst.

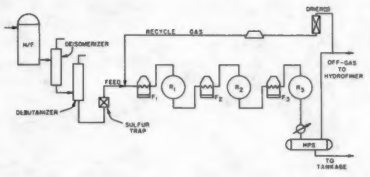
14. A process for improving the distillate yield of a petroleum residua feedstock comprising desulfurizing a hydrocarbon feedstock and subsequently fractionating the desulfurized product, separating a fraction having a boiling range of about 650°–775° F. and further reducung the sulfur content of said fraction by contacting said fraction with a catalyst comprising Pt/Zeolite Beta.

4,592,829

DESULFURIZATION OF HYDROCARBONS

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 26, 1984, Ser. No. 686,453
Int. Cl.[4] C10G *25/00, 35/09, 45/08*
U.S. Cl. 208—89 **13 Claims**



7. In a process for reforming a sulfur-containing naphtha feed, wherein is included in combination,

a hydrofiner which contains a metal catalyst, the metallic component of which is selected from Group VIB and Group VIII, with which the sulfur-containing naphtha feed is contacted with hydrogen, at reaction conditions inclusive of temperatures ranging from about 400° F. to about 850° F. to remove sulfur and provide a product naphtha which contains from about 5 wppm to about 50 wppm, and higher, sulfur,

a guard chamber filled with a sorbent into which said partially desulfurized hydrofined naphtha is injected to flow therethrough to effect further removal of sulfur, and

a reforming unit which contains a plurality of sulfur sensitive catalyst-containing on-stream reactors connected in series, the naphtha feed to which flows in sequence from one reactor of the series of another to contact the catalyst contained therein at reforming conditions,

the improvement comprising

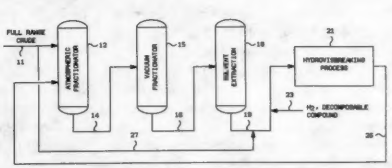
maintaining within said guard chamber a sorbent comprised of nickel in concentration ranging from about 10 percent to about 70 percent, calculated as metallic nickel based on the total weight of said sorbent, iron in concentration ranging from about 1 percent to about 15 percent, calculated as metallic iron based on the total weight of said sorbent, and a porous, refractory inorganic oxide, at temperatures ranging above about 350° F., to produce a reformer feedstock containing no more than about 2 wppm sulfur.

4,592,830

HYDROVISBREAKING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Jerald A. Howell; Donald C. Tabler, and Donald M. Haskell, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1985, Ser. No. 714,778
Int. Cl.[4] C10G *7/06, 47/32*
U.S. Cl. 208—94 **11 Claims**



1. A method for processing crude oil comprising steps of:

providing a full range crude oil as a feed to an atmospheric fractionator;

withdrawing an atmospheric topped crude oil from a lower

portion of said atmospheric fractionator and providing at least a portion of said atmospheric topped crude oil as a feed to a vacuum fractionator;

withdrawing a vacuum topped crude oil from a lower portion of said vacuum fractionator and providing at least a portion of said vacuum topped crude oil as a feed to a hydrovisbreaker;

supplying hydrogen to said hydrovisbreaker;

supplying a hydrogen donor solvent comprising the full range crude oil supplied to said atmospheric fractionator to said hydrovisbreaker, wherein at least a portion of the heavies in the portion of said vacuum topped crude oil provided to said hydrovisbreaker are cracked in said hydrovisbreaker; and

withdrawing the reaction effluent from said hydrovisbreaker.

4,592,831

SOLVENT FOR REFINING OF RESIDUES

Andrei Rhoe, Wyckoff; Joseph A. Pisani, Old Bridge; Gary L. Hamilton, Little Silver, and George D. Suciu, Ridgewood, all of N.J., assignors to Lummus Crest Inc., Bloomfield, N.J.

Filed Dec. 12, 1984, Ser. No. 680,924

Int. Cl.[4] C10C *1/18, 3/08*

U.S. Cl. 208—309 **14 Claims**

1. A process for solvent refining of a residual oil, comprising: solvent refining the residual oil with a refining solvent to produce a refined oil and a pitch fraction, said refining solvent being a solvent which produces a pumpable pitch fraction at a temperature at which the solvent refining pressure does not exceed 150 psig, said refining solvent comprising methanol and a propanol.

4,592,832

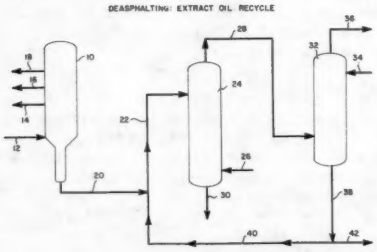
PROCESS FOR INCREASING BRIGHT STOCK RAFFINATE OIL PRODUCTION

Duncan J. Bristow; Biddanda U. Achia, both of Sarnia, and Lawrence J. Evers, Brights Grove, all of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 6, 1984, Ser. No. 648,013

Int. Cl.[4] C10G *21/00*

U.S. Cl. 208—309 **5 Claims**



1. In a process for increasing the amount of Bright Stock raffinate oil derived from the solvent extraction of deasphalted lube oil involving the steps of:

(a) extracting a vacuum residuum with a low molecular weight alkane hydrocarbon solvent resulting in a deasphalted lube oil solution and asphaltic residue;

(b) separating said deasphalted lube oil and said residue;

(c) separating said hydrocarbon solvent from said deasphalted lube oil;

(d) extracting said deasphalted lube oil obtained from step (c) with an aromatics solvent resulting in a Bright Stock raffinate oil solution and an extract oil solution, said extract oil solution comprised of dissolved aromatics and recoverable raffinate;

(e) separating said raffinate solution from said extract oil solution obtained from step (d); and

(f) separating said aromatics solvent from said extract oil solution obtained from step (e); in which said improvement comprises the steps of:

(g) recycling said extract oil from which the aromatics solvent has been removed, obtained from step (f), to step (a) and combining said extract oil with said vacuum residuum in a 10–20 LV %, based on said residuum, prior to said deasphalting;

(h) repeating step (a);

(i) repeating step (b);

(j) repeating step (c);

(k) extracting said deasphalted oil obtained from step (j) with said aromatics solvent resulting in said Bright Stock raffinate oil and said extract oil, wherein said obtained raffinate is present in a substantially greater amount, based on said vacuum residuum, as compared to said raffinate obtained in step (d).

4,592,833

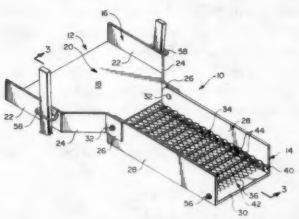
PORTABLE SLUICE BOX

Vernon Perdue, 1244 Shaner La., Ferndale, Wash. 98248

Filed Jan. 16, 1984, Ser. No. 570,781

Int. Cl.[4] B03B *5/54*

U.S. Cl. 209—44 **16 Claims**



1. A portable sluice box structure adapted to be carried conveniently to an operating location and to be positioned in a stream of water for classification of mineral particulate from detritus containing the same, said sluice box having a front upstream end, a rear downstream end, a longitudinal axis extending from said front end to said rear end, and a transverse axis, said box comprising:

a. infeed table means, including upstanding first sidewalls and a first bottom wall at a first level for receiving and confining a charge of mineral-containing detritus for fluid compelled movement along a path lying in a material handling plane generally coincident with said first bottom wall of said table means, said infeed table means having an open upstream end to receive an inflow of the stream of water over said first bottom wall and an open downstream end to discharge the charge under the influence of the moving stream;

b. a classification table means arranged to have, relative to said infeed table means, an operating position where said classification table means is secured to said infeed table means so as to extend therefrom in a downstream direction, said classification table means comprising two upstanding second sidewalls and a second bottom wall positioned at a second level below said first level, said classification table means having a foraminous separation plate which, with the classification table means in said operating position, is at a level above said second bottom wall but no higher than said first level and extending between said two second sidewalls, said classification table means having a substantially open upstream end which, with the classification table means in said operating position, communicates with the open downstream end of said infeed table means to receive the inflow of the stream of water

and said charge that passes over said first bottom wall and thence onto said separation plate along a primary path; said classification table means being further arrange to have, relative to said infeed table means, a collapsed position for carrying, where said classification table means and said infeed table means are positioned adjacent one another in general overlying relationship;

c. riffle means disposed transversely in a longitudinally spaced array beneath said separation plate and above said second bottom wall, said riffle means defining with said separation plate an upper flow channel intermediate said riffles and said separation plate through which water and particulate may pass along a secondary flow path and defining with said second bottom wall a lower mat channel intermediate said riffles and said second bottom wall for receiving a rentention mat; and,

d. inlet channel means at a juncture of said infeed and classification table means, disposed at a height beneath said separation plate and beneath said first bottom wall of said infeed table means, and above said second bottom wall of said classification means, said inlet channel means extending substantially across the full transverse extent of said classification table and facing in an upstream direction to receive an inflow of water from said stream of water to flow directly to said secondary flow path.

4,592,834

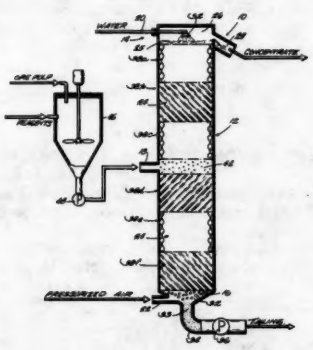
COLUMN FROTH FLOTATION

David C. Yang, Houghton, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Continuation of Ser. No. 504,793, Jun. 16, 1983, abandoned. This application May 9, 1985, Ser. No. 732,902

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **13 Claims**



7. A process for concentrating by froth flotation a floatable material in an aqueous pulp containing a mixture of floatable and non-floatable particles, said process including the steps of

providing a generally tubular flotation column having an upper portion including a cleaning zone, a lower portion including a scavenging zone, and an intermediate portion including a pulp inlet zone between said cleaning and scavenging zones;

providing in said cleaning and scavenging zones packing means defining a large number of flow passages extending n a circuitous pattern through the respective zone;

preparing the aqueous pulp for flotation separation of the particles of the aqueous pulp;

introducing the resulting pulp into the pulp inlet zone for flow through the flow passages of the packing means;

introducing wash water into the upper portion of the column for downward flow through the flow passages of the packing means;

introducing a pressurized inert gas into the lower portion of the column for upward flow through the flow passages of the packing means, whereby the gas is broken into fine bubbles which intimately contact the particles of the aqueous pulp in the flow passages of the packing means;

withdrawing a float fraction containing the floated particles of the aqueous pulp from the upper portion of said column above the cleaning zone; and

withdrawing a tailing fraction containing non-floated particles of the aqueous pulp from the lower portion of the column below the scavenging zone.

4,592,835

PRESSURE FILTER

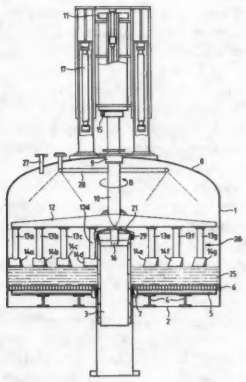
Max Grieder, Tecknau, Switzerland; Albert D. Evans, Lowton nr. Warrington, Great Britain, and Hans Weibel, Liestal, Switzerland, assignors to Rosenmund AG, Liestal, Switzerland

Filed Oct. 10, 1984, Ser. No. 659,481

Claims priority, application Switzerland, Oct. 18, 1983, 5663/83

Int. Cl.[4] B01D *23/20*

U.S. Cl. 210—107 **18 Claims**



1. A nutsch filter which comprises:

(a) a casing having a cover and a casing bottom with an aperture in the center of the bottom;

(b) a filter located within the casing;

(c) a discharge pipe with an opening at the upper end of the pipe, said discharge pipe passing through the aperture in the casing bottom, and said discharge pipe being axially moveable with respect to the casing;

(d) conveyor means within the casing for conveying the material of a filter cake in the direction of the center of the casing and into the upper opening of the discharge pipe, said conveyor means including an arm and a plurality of conveyor members located on the arm, said arm extending radially in the casing and attaching to a hollow shaft passing through the cover of the casing, said hollow shaft being capable of rotating and moving axially with respect to the casing, and said arm including on the lower side thereof a closing device for tightly sealing the upper opening of the discharge pipe when the discharge pipe strikes the lower side of the conveyor arm; and

(e) first drive means for rotatably and axially moving the hollow shaft with respect to the casing.

4,592,836

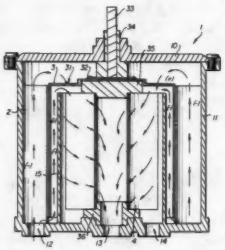
ELECTROSTATIC ENGINE OIL CLEANER

Yi-Shong Chiao, No. 4-2, La. 3, Tai An St., Taipei, Taiwan

Filed May 10, 1984, Ser. No. 608,683

Int. Cl.[4] B01D *41/00*

U.S. Cl. 210—168 **1 Claim**



1. An engine oil cleaner for contaminated oil containing metal particles, moisture, catalysts, and extraneous materials which comprises:

(a) an outer cylindrical metal casing body having means defining an annular flow passage, a base wall, and a cap bolted to said outer body;

(b) an inner annular metal casing wall extending vertically upwardly from said base wall to define an inner cavity;

(c) an upper and a lower insulated member at the top and bottom of said inner cavity;

(d) an annular filter cartridge held in said cavity by said upper and lower insulated members;

(e) a polar plate carried by said upper member and having a cylindrical sleeve extending downwardly between said outer body and said inner casing wall;

(f) a high voltage electrostatic generator connected to said polar plate to form an electrostatic field between said polar cap and sleeve portion and said outer casing wall and said inner casing wall;

(g) a corrugated porous paper board filter between said outer casing body and said inner casing wall and extending circumferentially therearound;

(h) means defining an inlet for contaminated oil under pressure in said outer casing body near the bottom thereof; and

(i) means defining an outlet for filtered oil disposed axially of the bottom of outer casing body beneath said filter cartridge, whereby contaminated oil may flow upwardly through said annular flow passage and downwardly through said filter cartridge while exposed to an electrostatic field, and passing through filtering media of said corrugated porous paper board and said filter cartridge.

4,592,837

APPARATUS FOR THE FILTERING OF SOLIDS-CONTAINING LIQUIDS

Gerhard Ludwig, Isernhagen; Jozsef Simon, Laatzen; Eckhard Zörkendörfer, Hanover; Günther Gappa, Gelsenkirchen; Knut Vaupel, and Jürgen Klein, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,933

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308287

Int. Cl.[4] B01D *23/10*

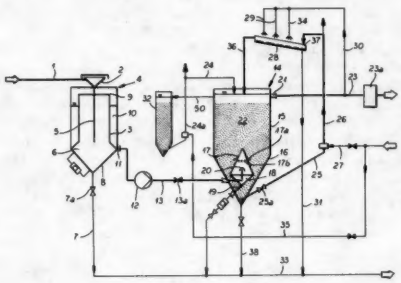
U.S. Cl. 210—189 **6 Claims**

1. An apparatus for filtering a solids-laden liquid comprising:

(a) means for degassing said solids-laden liquid, said degassing means including a funnel and means for introducing said liquid tangentially into said funnel;

(b) a sedimentation unit connected to said degassing means for sedimenting large particles from said solids-laden liquid, said funnel opening into said unit;

(c) a cylindrical upright vessel traversed downwardly by a moving bed of porous granulate connected to said unit for upward flow therethrough of said liquid whereby fine particles from said liquid adhere to said granulate and are filtered from said liquid, said bed being provided with an upwardly converging perforated distributor and separator cone into which said liquid is fed which discharges said liquid into said bed, said cone having a sedimentation



compartment provided with means for withdrawing particles of an intermediate size therefrom;

(d) a pulsating conveyor connected to the bottom of said vessel for displacing granulate to which fine particles adhere, thereby loosening adhesion of fine particles to said granulate; and

(e) washing means separate and spaced from said vessel receiving the granulate from said pulsating conveyor for treating said particles with a washing liquid to remove said fine particles therefrom and for recycling washed granulate to said bed.

4,592,838

FILTER INCORPORATING TWO DISTINCT FILTERING STACKS

Théophile Christophe, Fontenay Le Fleury, and Jean-Claude Moatti, Boulogne, both of France, assignors to Georges Moatti, France

Filed Nov. 6, 1984, Ser. No. 668,704

Claims priority, application France, Nov. 16, 1983, 83 18229

Int. Cl.[4] B01D *25/02, 25/32*

U.S. Cl. 210—323.1 **2 Claims**

1. In a filter constituted by:

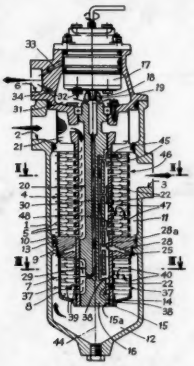
a filter body comprising a plurality of distinct chambers isolated from one another,

a main stack of filtering elements contained in one of said chambers, called main chamber,

a secondary stack of filtering elements contained in another of said chambers, called secondary chamber, each of the filtering elements of the main and secondary stacks having a recessed centre and a cylindrical side, comprising a plurality of sections isolated from one another and being provided on its outer and inner radial circumferences with orifices for communication of each of its sections with said circumferences,

a shut-off distribution valve which is adjusted to said cylindrical side, which is mounted to rotate about the axis of the cylindrical side, and which comprises one main enclosure capable, in a first position of the distribution valve, of isolating a first section of any one filtering element of the main stack from the other sections of said filtering element and of communicating with said first section via the orifice for communication of said first section, and one secondary enclosure capable, in a second position of the distribution

valve of isolating a first section of any one filtering element of the secondary stack from the other sections of said filtering element and of communicating with said first



section via the orifice for the communication of said first section, and wherein

a port, with which the distribution valve is provided, connects the main and secondary enclosures.

4,592,839

MULTIPLE-DISC FILTER

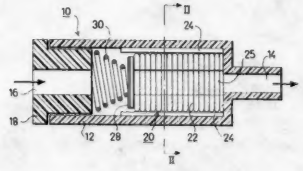
Peretz Rosenberg, Moshav Beit Shearim, Israel

Filed May 23, 1984, Ser. No. 613,351

Claims priority, application Israel, Jun. 9, 1983, 68935; Sep. 7, 1983, 69679

Int. Cl.[4] B01D *29/38, 29/46*

U.S. Cl. 210—352 **7 Claims**



1. A filter including:

a housing having an inlet and an outlet;

a stack of filter elements within said housing for filtering the fluid flowing therethrough from the housing inlet to the housing outlet;

said stack of filter elements having an upstream surface facing the housing inlet and a downstream surface facing the housing outlet;

a pressure member located within the housing in the path of the inletted fluid upstream of the filter elements such as to be impinged by the fluid introduced into the housing via its inlet, to constrain the fluid to flow to the upstream surface of the stack of filter elements and therethrough to the housing outlet, and to press the filter elements together by the force of the inletted fluid to tighten the stack when the fluid flows from the housing inlet to the housing outlet;

and a spring acting against said pressure member such that:

(a) when the fluid is introduced into the housing in a forward direction via said inlet, the force of the spring adds to the force of the fluid to cause the pressure member to constrain the fluid to flow in the forward direction to the upstream surface of the stack and to press the filter elements together to tighten the stack, for a normal filtering operation during which solid particles are separated from the fluid and accumulate on the upstream surface of the stack and between the filter elements of the stack;

(b) and when the fluid is introduced into the housing via said outlet so as to flow in the reverse direction first to the downstream surface of the stack and then through the stack, the force of the fluid causes the pressure member to move against the force of the spring to loosen the stack and thereby to permit the fluid to flush out the solid particles accumulated between the filter elements of the stack and on the upstream surface of the stack.

4,592,840

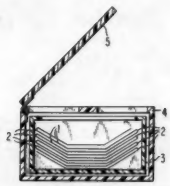
EASY REACH COFFEE FILTERS AND OPTIONAL REUSABLE STORAGE CONTAINER

David L. Brooks, 6766 Racquet Club Dr., Memphis, Tenn. 38119

Filed Jul. 22, 1985, Ser. No. 757,363

Int. Cl.[4] B01D *35/02*

U.S. Cl. 210—493.5 **1 Claim**



1. A coffee filters assembly, comprising, in combination, an elongated, strip of filter paper die-cut into a row of a plurality of interconnected circular sections having an interconnection therebetween, said interconnection comprising a short length of uncut abutting peripheries of adjacent said sections, a straight row of perforations across said interconnection, a peripheral portion of each said section being radially folded forming a plurality of flutes and shaping said section into a cup, each adjacent said cup being dished into opposite directions, a fold along each said row of perforations, each alternate said fold being in the same direction and opposite to the said folds therebetween, whereby all said cups are nested one into another; and said assembly including a dispenser for said cups, said dispenser comprising an open-topped inner box containing said nested cups and a hinged-covered box containing said inner box.

4,592,841

EQUIPMENT AND PROCESS FOR THE TREATMENT OF SWIMMING POOL WATER WITH A SEMI-PERMEABLE MEMBRANE

Bernard Ancelle, and Serge Lambert, both of Lyons, France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 7, 1984, Ser. No. 607,451

Claims priority, application France, May 5, 1983, 83 07741

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—651 **14 Claims**

7. Apparatus for the treatment of water from a swimming pool such as a municipal swimming pool comprising:

a recycling tank,

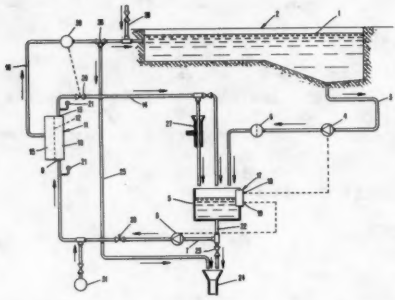
first conduit means for conducting water from the swimming pool to said recycling tank without passing that water through any sand filters or diatomaceous filters,

a separating unit including upstream and downstream compartments with a semi-permeable membrane structure disposed between said upstream and downstream com-

partments, said membranes having a cut-off threshold of between 5,000 and 500,000,

second conduit means separate from said first conduit means for conducting water from an outlet of said reycling tank to an inlet of said upstream compartment without passing that water through any sand filters or diatomaceous filters, wherein such water contacts said semi-permeable membrane structure,

third conduit means for conducting, from an outlet of said upstream compartment, a fraction of water which has not



passed through said semi-permeable membrane structure and delivering such water to said recycling tank without passing that water through any sand filters or diatomaceous filters, that water being recycled back to said separating unit, and

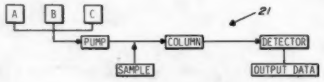
fourth conduit means for conducting, from an outlet of said downstream compartment, a fraction of water which has passed through said semi-permeable membrane structure and delivering such water to the swimming pool without passing that water through any sand filters or diatomaceous filters.

4,592,842

METHOD AND APPARATUS FOR OPTIMIZING PEAK DETECTION IN A CHROMATOGRAM

Barrett L. Tomlinson, Santa Clara, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 8, 1984, Ser. No. 587,577
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—659 **9 Claims**



1. A method of identifying peaks corresponding to the same chemical component in a series of liquid chromatograms, said method comprising,

chromatographing a sample using several different eluents of approximately the same eluent strength, said eluents being composed of varying mixtures of two binary eluents;

determining the retention times and areas of all peaks in each chromatogram;

forming combinations of peaks, one peak from each chromatogram, such that the set of all combinations of peaks formed is guaranteed to contain a combination of peaks all corresponding to one chemical component of the chromatogram;

testing each combination of peaks in said set by determining the equation of the straight line best describing peak retention times as a function of eluent compositions and computing the relative standard deviations of the set of said straight line to the retention times of the peaks of said combination;

selecting the peak combination and associated straight line factor having the lowest relative standard deviation of any peak combination of the set as containing peaks all corresponding to the same chemical component;

determining the minimum peak area in the identified peak combinations;

removing said minimum peak area from peaks having the retention times of the identified peak configuration; thereby removing this peak area from the collection of peak retention times and areas not identified in each chromatogram; and

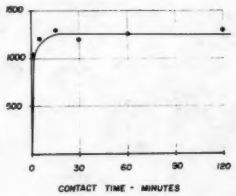
repeating formation of sets of peak combinations, testing, selecting, determining and removing until all areas in one chromatogram are assigned or until the relative standard deviation of the best fit straight line exceeds some pre-set threshold.

4,592,843

METHOD FOR REMOVAL OF ORGANOMETALLICS FROM WASTEWATER

Lawrence J. Guilbault, and Thomas C. McEntee, both of Topsfield, Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 3, 1984, Ser. No. 657,118
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—692 **7 Claims**



1. A method for reducing the concentration of organometallic nonionic compounds selected from the group consisting of organotin, organolead, organomercury, organoarsenic, organobismuth, organoselenium, organotellurium, and admixtures thereof from aqueous media, comprising contacting said aqueous media containing an initial concentration of at least one of said organometallic nonionic compounds with sufficient solid polyamide absorbent material to cause said polyamide material to absorb at least a portion of said organometallic compound from said media and separating said absorbent and said aqueous media folowing said contacting step to thereby obtain a concentration of said organometallic compound in said aqueous media that is lower than said initial concentration.

4,592,844

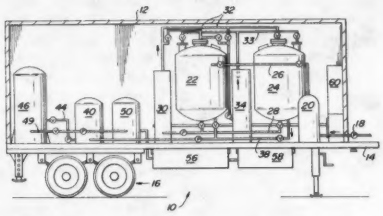
METHOD OF DECONTAMINATING HYDROCARBONS CONTAINING PCB

Robert G. Layman, Barto, and Linwood B. Kemp, Birdsboro, both of Pa., assignors to Chemical Decontamination Corporation, Birdsboro, Pa.

Continuation-in-part of Ser. No. 538,307, Oct. 3, 1983, Pat. No. 4,514,294. This application Feb. 28, 1985, Ser. No. 706,589
Int. Cl.[4] B01D *57/00*; C10G *29/04*
U.S. Cl. 210—709 **12 Claims**

1. A method of removing PCB from hydrocarbons comprising the steps of heating hydrocarbons containing PCB but substantially free of water to a temperature of above 97.6° C., melting sodium by directing a portion of the heated hydrocarbon to a vessel containing said sodium, said sodium having a

size greater than 20 microns, blending the melted sodium and hydrocarbons, forming a by-product until the amount of PCB



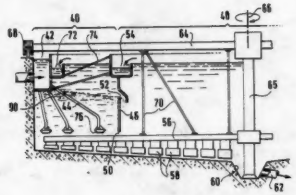
is reduced to about 2 ppm or less and then separating the by-product from the hydrocarbon.

4,592,845

SLUDGE BELT METHOD OF CLARIFYING A LIQUID CHARGED WITH SOLID MATTER

Pierre Lejeune, and Louis Berthod, both of Grenoble, France, assignors to Alsthom-Atlantique, Paris, France

Filed Jul. 31, 1985, Ser. No. 760,861
Claims priority, application France, Jul. 31, 1984, 84 12142
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—715 **4 Claims**



1. A sludge belt method of clarifying a liquid charged with solid material, said method being applied to a liquid charged with fine particles in suspension to provide both a clarified liquid and a sludge, said method comprising the following operations:

adding a flocculation additive to said charged liquid to make a mixture in which those of said fine particles which meet one another bind together and form flakes;

substantially continuously inserting said mixture into a distribution chamber **(42)** having substantially uniform pressure and which conveys said mixture into a clarification chamber **(40)** via a plurality of injectors **(44)** distributed over the surface of said chamber, and each having an axis **(80)**;

removing clarified liquid via a liquid-removal orifice **(72)** in the upper portion of said clarification chamber **(40)**;

removing sludge from said clarification chamber via at least one sludge-removal orifice **(50, 52)** situated substantially further down than said liquid removal orifice **(72)**;

said injectors **(44)** being likewise situated further down than said liquid-removal orifice **(72)**, and injecting the mixture at a selected rate such as to form a belt of sludge above the injectors whereby the mixture rises through said belt between flakes which have already been formed, and the fine particles still in suspension in said mixture bind said flakes and increase the volume thereof, and forming a layer of clarified liquid above the belt of sludge;

each of said injectors **(44)** being provided with guide means **(78)** defining an expansion zone

establishing between the distribution chamber **(42)** and the outlet from each of the said injectors **(44)**, an internal head loss which is greater than a minimum value, and which is substantially equal at each of said injectors, said minimum value being equal to the bottom pressure difference between two columns of liquid having the same height as the maximum height of the sludge belt above the injectors, one of said columns being constituted by clarified liquid and the other being constituted by the densest sludge likely to be formed in the sludge belt, thereby imposing substantially uniform distribution to the flow rate of charged liquid through the various injectors in spite of the beginnings of irregularity which occur spontaneously in said sludge belt;

said injector **(44, 112)** guide means **(78, 114)** are so disposed that the injected flow of charged liquid forms jets which diverge away from the injector axes **(80)**; and

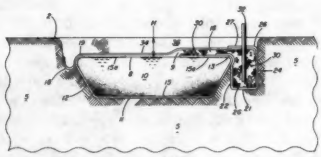
the pressure and/or height of the mixture in the distribution chamber **(42)** being chosen to impart an injection speed to said jets sufficient for forming, under said sludge belt and on either side of the axis of each injector, primary vortices **(W1)** moving initially away from the injector axes up to the edges of injector expansion zones, then rising, and then returning towards the injector axes in order to provide controlled agitation in the lower layers of said sludge belt, the distance between adjacent injectors being selected such that said expansion zones meet one another and occupy substantially the entire area of the clarification chamber under the sludge belt.

4,592,846

METHOD AND RESERVOIR FOR IN-GROUND CONTAINMENT OF LIQUID WASTE

Donald D. Metzger, Alma, and Jeffrey E. Merriman, Mt. Pleasant, both of Mich., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 3, 1985, Ser. No. 771,961
Int. Cl.[4] E02D *19/18, 19/20*
U.S. Cl. 210—747 **11 Claims**



1. A method for the containment of liquid-containing waste material, comprising providing an in-ground reservoir having a bottom and defining walls opening upwardly toward the surface of the ground, providing an in-ground drain area proximate to a side of the reservoir, said drain area having a near wall adjacent to the reservoir, a sloping bottom and a distal wall, the top of the near wall and bottom of the drain area being below the top of the in-ground reservoir, installing continuous flexible liquid-impervious liners having extended sides on the bottom and against the defining walls of the reservoir and on the bottom and against the walls of the drain area, the adjacent sides of the reservoir and drain area liners being bonded together to form a liquid-impermeable seal, introducing liquid-containing waste material to the reservoir to a predetermined height, overlapping in part the waste material with the extended ends of the reservoir liner, thereby leaving a portion of the waste material uncovered, charging the drain area with ballast material, thereby to form a porous bed, and providing the drain area with a standpipe extending from near the bottom of the low end of the drain area to above the surface of the ground, covering the extended side of the reservoir liner adjacent to the drain area resting atop the waste material with ballast material, thereby providing a liquid passageway from the uncovered portion of the waste material to the drain area, covering the reservoir and drain area with a further flexible liquid-impervious liner cap, bonding together the extended distal side of the drain area liner with the adjoining liner cap to form a liquid-impermeable seal, and covering the reser-

voir and drain area with soil, whereby liquid exuded from the reservoir passes through the liquid passageway into the drain area.

4,592,847

PROCESS AND APPARATUS FOR CLEANING FILTER ELEMENTS, ESPECIALLY FILTER CARTRIDGES

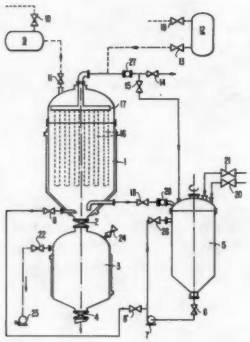
Heinz O. Schumacher, Höperfeld 26, D-2050 Hamburg 80, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,560

Claims priority, application European Pat. Off., Mar. 8, 1984, 84102502.6

Int. Cl.[4] B01D *29/32, 29/38*

U.S. Cl. 210—770 **12 Claims**



1. Process for cleaning filter cartridges after filtration of solutions containing solid impurities in organic, polar and non-polar solvents, wherein at least a solution is added through filter cartridges, and pure solution, after passing the filter cartridges, is collected and drawn off, while the solid impurities are retained on the outer surface of the filter cartridges by building up a filter cake which, after reaching a nominal thickness or by depending on a pressure drop in a supply pipe to the filter cartridges, is discharged from the same, comprising the steps of:

connecting a container holding the filter cartridges to a receiver through a quickly operating locking element;

generating an underpressure (P_2) in said receiver with the locking element being closed, while at the same time building up an overpressure (P_1) in the container holding the filter cartridges;

causing a spontaneous pressure release between (P_1) and (P_2) to take place in a single pass by opening the locking element connecting the receiver with the container of the filter cartridges, with a pressure difference $\Delta P=(P_1-P_2)$ equal to a value between about 0.05 and 12.5 bar;

adjusting temperature in the container so that, in consequence of the combination with spontaneous pressure release, liquid contained in the filter cake is evaporated, thereby causing the filter cake to burst off from the cartridge surface; and

collecting the filter cake in the receiver.

4,592,848

FLOW THROUGH FILTER WITH BACKFLUSH CLEARING CAPABILITY

Richard E. Pabst, 1715 Target Ct., Houston, Tex. 77043

Filed Dec. 11, 1984, Ser. No. 680,399

Int. Cl.[4] B01D *29/06, 29/38*

U.S. Cl. 210—798 **27 Claims**

1. A reusable, flow-through filtering apparatus for removing particulate matter from a liquid solution comprising:

inlet means through which the solution to be filtered enters a primary filter path through the apparatus;

first outlet means through which filtrate exits said apparatus;

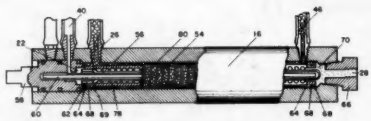
second outlet means through which filtered particulate matter exits said apparatus;

a filter body surrounding and housing a porous rigid filtering means, said filtering means allowing filtrate to pass through its pores and causing particulate matter to lodge on an outer surface of the filtering means and within pores of said filtering means;

non-rigid expanding means positioned inside said filtering means, said expanding means when supplied with pressure from a pressure source expanding first so as to form discrete compartments along the length of the filter path of said filtering means and secondly so as to contact an interior surface of said filtering means;

switching means for switching an operating mode of said apparatus between a filtering mode and a clearing mode;

whereby when said switching means is in a filtering mode and solution enters the filter through said filtering means the filter is separted from the particulate matter with the particulate matter being captured by said filtering means, and when said switching means is switched to said clearing mode a clearing solution enters the filtering body and a pressure source supplies pressure to said expanding means thereby uniformly forcing particulate matter from



said pores and said surface of said rigid filtering means to be carried away by said clearing solution.

23. A method of filtering particulate matter from a liquid solution comprising the steps of:

providing a rigid porous filtering means for allowing filtrate to pass through while capturing the particulate matter;

providing a non-rigid expanding means positioned within said filtering means and a pressure source connected to said expanding means for causing expansion of said expanding means;

providing ridges along the length of said filtering means between said filtering means and said expanding means;

passing the liquid solution over an exterior surface of said filtering means;

capturing particulate matter in pores and on said exterior surface of said rigid porous filtering means while allowing filtrate to pass through said filtering means;

applying a pressure from said pressure source to said expanding means to cause said expanding means to expand and contact first said ridges to form discrete compartments containing the liquid solution and secondly said interior surfaces of said filtering means thereby forcing particulate matter out of said pores of said filtering means;

passing a clearing medium over said exterior surface of said filtering means to remove the particulate matter from said exterior surface of said filtering means.

4,592,849

METHOD FOR REMOVING WATER FROM PRODUCED CRUDE OIL

James M. McMillen, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 548,488, Nov. 3, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 714,355

Int. Cl.[4] B01D *17/022*

U.S. Cl. 210—799 **8 Claims**

1. A method for removing emulsified water from a crude oil

stream produced from a subterranean, oil-containing formation, the oil stream containing about 14 to about 65% by volume of emulsified water consisting essentially of:

(a) passing the crude oil stream containing emulsified water through a bed of a water-saturated hydrophilic coalescing medium selected from the group consisting of sand, crushed quartz, diatomaceous earth, porous silica and ground walnut shells, whereby the water coalesces and an oil phase, substantially free of water, and a water phase are formed; and

(b) separating the oil phase containing less than 3 volume percent of water from the water phase by gravitational separation or centrifuging.

4,592,850

INJECTION WATER VISCOSIFIER FOR ENHANCED OIL RECOVERY

Kenneth F. Castner, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 378,154, May 14, 1982, Pat. No. 4,526,947. This application Mar. 4, 1985, Ser. No. 708,183

Int. Cl.[4] E21B *43/22*

U.S. Cl. 252—8.55 D **20 Claims**

1. In a method for recovering petroleum from a subterranean petroleum bearing deposit which comprises injecting viscous water into the area of said deposit through at least one input well, thereby causing said petroleum to flow from said area for collection through at least one output well, the improvement which comprises injecting said viscous water containing a water soluble polymer with chain linkages derived from a major amount of N,N-dimethylacrylamide and at least one member selected from the group consisting of N-methylolacrylamide and sodium styrene sulfonate into the area of said deposit, wherein said water soluble polymer has a molecular weight in excess of 1,000,000 and wherein said water soluble polymer has between about 0.1 and about 5 percent by weight of its chain linkages being derived from members selected from the group consisting of N-methylolacrylamide and sodium styrene sulfonate.

4,592,851

LUBRICATING OIL COMPOSITION AND METHOD FOR PROVIDING IMPROVED THERMAL STABILITY

William H. Stadtmiller, Colonia, N.J., and Kenneth G. Morris, Graniteville, S.C., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 183,389, Sep. 2, 1980, abandoned. This application Dec. 6, 1982, Ser. No. 447,120

Int. Cl.[4] C10M *125/22, 125/24, 129/91*

U.S. Cl. 252—32.7 E **13 Claims**

1. A lubricating oil composition with improved thermal stability and anti-corrosion properties comprising a major amount of paraffinic mineral oil, from about 0.1 to about 1.5% by weight of a basic zinc dialkyl dithiophosphate having alkyl groups made from primary alcohols containing from about 4 to about 20 carbon atoms and a zinc to phosphorus ratio of about 1.15–1.65 to 1 and from about 0.05 to about 1.0% by weight of 2,6 di-tertiary butyl phenol, said composition having a viscosity of about 4 to about 160 cSt at 40° C. and a VI of from about 80 to about 115.

9. In the method of lubricating a hydraulic system using a hydraulic lubricating oil the improvement comprising providing improved thermal stability and anti-corrosion properties by using a lubricating oil which contains a major amount of paraffinic mineral oil basestock and a combination of from about 0.1 to about 1.5% by weight of a basic zinc dialkyl dithiophosphate having alkyl groups made from primary alcohols containing from about 4 to about 20 carbon atoms and a zinc to phosphorus ratio of about 1.15–1.65 to 1 and from about 0.05 to about 1.0% by weight of 2,6 di-tertiary butyl phenol.

4,592,852

COMPOSITION AND PROCESS FOR TREATING PLASTICS WITH ALKALINE PERMANGANATE SOLUTIONS

Constantine I. Courduvelis, Orange, and Anthony R. Del Gobbo, Watertown, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Filed Jun. 7, 1984, Ser. No. 618,281

Int. Cl.[4] C23C *18/22;* C23F *1/32*

U.S. Cl. 252—79.1 **10 Claims**

1. An alkaline composition for treating plastics to improve the adhesion of electroless metal plating thereto comprising:

(a) a source of permanganate ions in an amount of about 1 g/l to its limit of solubility; and

(b) an effective amount of a secondary oxidant capable of oxidizing manganate ion to permanganate ion wherein the secondary oxidant is selected from the group consisting of chlorine, bromine, ozone, hypochlorite salts, metaperiodate salts and trichloro-s-trianzinetrione salts.

4,592,853

DICYCLOPENTADIENE DICARBOXYLIC ACID SALTS AS CORROSION INHIBITORS

Jerome W. Darden, and Edward E. McEntire, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 8, 1985, Ser. No. 731,821

Int. Cl.[4] C09K *5/00*

U.S. Cl. 252—75 **14 Claims**

1. A corrosion inhibited antifreeze composition comprising a water-soluble liquid alcohol freezing point depressant and an effective amount of an inhibitor comprising:

a dibasic acid salt selected from the group consisting of the alkali metal salts of:

hexahydro-4,7-Methanoindene-1,5-dicarboxylic acid,
hexahydro-4,7-Methanoindene-1,6-dicarboxylic acid,
hexahydro-4,7-Methanoindene-3,5-dicarboxylic acid,
hexahydro-4,7-Methanoindene-3,6-dicarboxylic acid,
hexahydro-4,7-Methanoindene-2,5-dicarboxylic acid,
hexahydro-4,7-Methanoindene-2,6-dicarboxylic acid and mixtures thereof.

4,592,854

STEEL ETCHANT

Walter E. Lindner, and Dolphus L. Coggins, both of St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jan. 9, 1985, Ser. No. 690,095

Int. Cl.[4] C09K *13/08;* C23F *1/00*

U.S. Cl. 252—79.3 **21 Claims**

1. A steel etchant composition effective on a wide variety of steel alloys, the composition comprising nitric acid and hydrofluoric acid in amounts effective to etch a wide variety of steel alloys and an etch rate control agent, the etch control agent being effective in the amount present to achieve a uniform etch rate in a wide variety of steel compositions under rapid etch conditions.

4,592,855

EFFERVESCENT COMPOSITIONS

Anthony J. Gioffre, 2451 NW. 30th, Ridgefield, Conn., and Ronald J. Ross, Upper Nyack, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 16, 1984, Ser. No. 672,350

Int. Cl.[4] C11D *17/00, 7/02*

U.S. Cl. 252—89.1 **16 Claims**

1. An effervescent composition which upon contacting with water provides effervescent and cleaning action comprising an essentially anhydrous base medium and an effective amount of a gas-containing inorganic oxide material selected from the group consisting of zeolites, aluminophosphates, silicoaluminophosphates and mixtures thereof containing an effective amount of an adsorbed gas between about 1 and about 25

percent by weight to provide effervescence upon contact of the effervescent composition with water.

4,592,856

LIQUID DETERGENT COMPOSITION

Taishi Kobayashi, and Shinichiro Akase, both of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,537

Claims priority, application Japan, Nov. 14, 1983, 58-213476; Apr. 9, 1984, 59-70551

Int. Cl.[4] C11D *7/22*

U.S. Cl. 252—162 7 Claims

1. A liquid detergent composition which comprises:

(a) a halogenated hydrocarbon solvent;

(b) a surface active agent selected from the group consisting of anionic and non-ionic surface active agents in an amount from 0.01 to 10% by weight based on the overall amount of the detergent composition; and

(c) a quaternary ammonium hydroxide in an amount from 0.001 to 20% by weight based on the overall amount of the detergent composition.

4,592,857

2,3-DICYANO-5-SUBSTITUTED PYRAZINES

Shigeru Sugimori, Fujisawashi, and Yasuyuki Goto, Yokohamashi, both of Japan, assignors to Chisso Corporation, Osaka, Japan

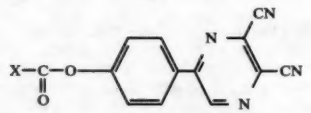
Filed Aug. 17, 1984, Ser. No. 641,730

Claims priority, application Japan, Aug. 22, 1983, 58-152892; Oct. 17, 1983, 58-193839

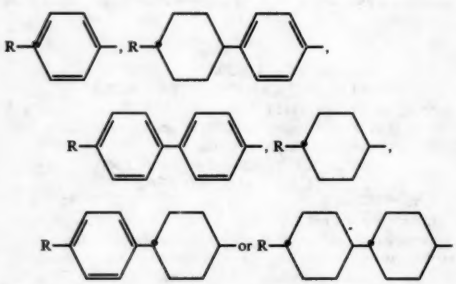
Int. Cl.[4] C09K *3/34;* G02F *1/13;* C09D *241/00, 241/02*

U.S. Cl. 252—299.61 22 Claims

1. A 2,3-dicyano-5-substituted pyrazine expressed by the formula:



wherein X represents R—,



and R represents a linear chain alkyl group or an alkyloxy group, each of 1 to 10 carbon atoms.

4,592,858

SMECTIC LIQUID CRYSTAL COMPOUND AND LIQUID CRYSTAL COMPOSITIONS

Ryoichi Higuchi, Tokyo; Masao Honma, Yokohama; Takao Sakurai, Kawasaki, and Naoko Mikami, Yokohama, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,668

Claims priority, application Japan, Apr. 13, 1984, 59-74748

Int. Cl.[4] C09K *3/34;* G02F *1/13;* C07C *69/76, 69/00*

U.S. Cl. 252—299.66 7 Claims

1. A liquid crystal compound of the formula:

R^1 is an alkyl group, X is halogen, and R^2 is selected from the group consisting of a branched-alkyl group; and benzyl and the carbon atom marked with an * is an asymmetric carbon atom.

4,592,859

OIL-IN-WATER OR WATER-IN-OIL SUSPENSIONS AND USES THEREFOR

Robert Smith-Johannsen, Incline Village, Nev., assignor to Ramu International, Incline Village, Nev.

Continuation of Ser. No. 418,790, Sep. 16, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,633

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—309 19 Claims

1. A process for preparing stable suspensions of water and oil which comprises mixing water, at least one anionic agent, and at least one cationic agent to form a mixture; said anionic and cationic agents able to react in said mixture to form a reaction product of colloidal particles having a zeta potential of between about +18 and −18 millivolts; and adding oil to said mixture to form a stable suspension.

10. A stable suspension of water and oil comprising a first liquid phase of oil or water, an immiscible second liquid phase of water or oil, respectively, and solid colloidal particles comprising the reaction product of at least one anionic agent and at least one cationic agent, said colloidal particles surrounding the liquid droplets of the second liquid phase and having a zeta potential between about +18 and −18 millivolts.

4,592,860

PROCESS AND APPARATUS FOR AMMONIA SYNTHESIS GAS PRODUCTION

Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 7, 1984, Ser. No. 577,836

Int. Cl.[4] C01B *3/26*

U.S. Cl. 252—376 13 Claims

1. An improved process for the production of ammonia synthesis gas comprising:

(a) catalytically reacting a hydrocarbon feed stream with steam in a primary reforming unit to form a primary reformed gas mixture containing hydrogen and carbon monoxide;

(b) passng said primary reformed gas mixture to a secondary reforming unit for reaction of unconverted methane present therein with air, the amount of said air introduced to said secondary reforming unit being considerably in excess of that required to furnish the stoichiometric amount of nitrogen required for reaction with hydrogen for said ammonia synthesis;

(c) subjecting said secondary reformed gas mixture to water gas shift conversion to convert most of the carbon monoxide present in said reformed gas mixture to hydrogen and carbon dioxide;

(d) passing the thus-shifted gas mixture containing hydro-

gen, carbon dioxide, residual carbon monoxide, methane, argon and said excess nitrogen, without necessary treatment for removal of a major portion of the carbon dioxide content thereof and without methanation to remove carbon oxides to low levels, to a pressure swing adsorption system capable of selectively adsorbing carbon dioxide, carbon monoxide, methane and other impurities from said hydrogen and from a portion of said nitrogen present in the gas passed to said system, the processing cycle in the pressure swing adsorption system comprising:

(i) introduction of the thus-shifted gas mixture to the inlet end of an adsorbent bed at an adsorption pressure level, with adsorption of impurities therefrom and discharge of a partially purified ammonia synthesis gas mixture of hydrogen and nitrogen from the discharge end thereof, excess nitrogen being adsorbed in the adsorbent bed;

(ii) partial cocurrent depressurization of the adsorbent bed with release of hydrogen-containing void space gas from the discharge end of the bed upon being displaced by desorbed nitrogen, the nitrogen peak in the bed, being rolled up by the trailing adsorbed carbon dioxide front, then being pushed out of the discharge end of the bed, said nitrogen being used to provide purge gas to another adsorbent bed in the system;

(iii) countercurrent depressurization of the bed with release of gas from the inlet end thereof, thereby depressurizing the bed to its lower desorption pressure;

(iv) introduction of purge gas comprising desorbed nitrogen to the discharge end of the bed at its lower desorption pressure level, with discharge of purge gas effluent from the inlet end of the bed;

(v) repressurization of the purged bed to said adsorption pressure level; and

(vi) repetition of said cyclic steps (i)–(v) with additional quantities of the thus-shifted gas mixture, whereby excess nitrogen present in the reformed gas mixture being treated is conveniently used in the pressure swing adsorption system as purge gas and high hydrogen recoveries can be obtained, and the desired ammonia synthesis gas is produced without a requirement for employing an air separation or nitrogen plant to provide the nitrogen content of said ammonia synthesis gas.

4,592,861

ANTISTATIC THERMOPLASTIC COMPOSITION COMPRISING A GRAFT POLYMER, HALOGENATED THERMOPLASTIC POLYMER AND CONDUCTIVE CARBON BLACK

Solomon Bekele, South Bend, Ind., and Victor W. Lee, Deerfield, Ill., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Jun. 8, 1984, Ser. No. 618,631

Int. Cl.[4] C08K *3/04*

U.S. Cl. 252—511 **7 Claims**

1. An antistatic thermoplastic composition comprising a blend of

(a) a thermoplastic graft polymer;

(b) a thermoplastic halogenated polymer; and

(c) an amount of conductive carbon black effective to cause the composition to have a surface resistivity of 10^2–10^{12} ohm/square,

wherein the ratio of (a)/(b) is from 9:1–1:9, by weight and the weight percentage of (c) is from 2–10%.

4,592,862

CONDUCTIVE RESIN COMPOSITION AND INFORMATION RECORD

Mutsuaki Nakamura; Kazuhira Namikawa; Toshiaki Hamaguchi; Akio Kuroda, all of Yokohama; Akio Hata, and Noriki Fujii, both of Shinnanyo, all of Japan, assignors to Victor Company of Japan, Ltd., and Tokuyama Sekisui Industry, Corporation Limited, both of, Japan

Filed Mar. 5, 1985, Ser. No. 708,483

Claims priority, application Japan, Mar. 6, 1984, 59-41439

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 **10 Claims**

1. A conductive resin composition which comprises a graft polymer obtained by graft-polymerizing 85 to 99 parts by weight of vinyl chloride with, correspondingly, 15 to 1 parts by weight of a copolymer of ethylene and an acrylic ester selected from methyl acrylate, ethyl acrylate and 2-ethylhexyl acrylate, and a conductive powder selected from carbon black, Au, Pt and Al and used in an amount of from 10 to 30 wt% of the graft polymer, the copolymer of ethylene and an acrylic ester including 10 to 65 wt% acrylic ester.

4,592,863

PROTEIN PP_{20}, A PROCESS FOR OBTAINING IT, AND ITS USE

Hans Bohn, Marburg, and Wilhelm Winckler, Wenkbach, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,895

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338480

Int. Cl.[4] C07K *15/00;* A61K *35/50, 39/395;* C07G *7/26*

U.S. Cl. 530—350 **3 Claims**

1. The protein PP_{20} which has the following characteristics:

(a) an electrophoretic mobility which is somewhat faster than that of albumin,

(b) an isoelectric point of 4.65±0.1,

(c) a sedimentation coefficient $s_{20,w}$ of 4.1±0.1 S,

(d) a molecular weight determined by electrophoresis in sodium dodecyl sulfate (SDS)-containing polyacrylamide gel of 50,000±10,000, the molecules of PP_{20} being composed of apparently identical subunits which have a molecular weight of 27,000±3,000 and are held together non-covalently,

(e) an extinction coefficient $E_{1\ cm}^{1\%}$ (230 nm) of 9.5±0.6,

(f) a carbohydrate content of 3.0±1.3%, including mannose 0.14±0.05%, fucose 0.13±0.05%, galactose 0.61±0.2%, glucose 0.39±0.2% N-acetylglucosamine 0.95±0.3%, N-acetylgalactosamine 0.18±0.1%, N-acetylneuraminic acid 0.6±0.4%, and

(g) the following aminoacid composition:

Aminoacid	(Residues per 100 residues) mole-%	Coefficient of variation
Lysine	5.36	0.26
Histidine	3.10	7.30
Arginine	3.39	0.63
Aspartic acid	11.45	1.05
Threonine	8.63	1.31
Serine	3.70	1.34
Glutamic acid	9.65	1.61
Proline	5.64	6.40
Glycine	6.96	1.12
Alanine	4.76	1.49
Cystine ½	2.86	2.47
Valine	6.22	0.23
Methionine	1.87	1.51
Isoleucine	5.76	3.44
Leucine	11.76	2.65
Tyrosine	2.55	3.33

-continued

Aminoacid	(Residues per 100 residues) mole-%	Coefficient of variation
Phenylalanine	4.12	1.55
Tryptophan	2.17	1.30.

4,592,864

AQUEOUS ATELOCOLLAGEN SOLUTION AND METHOD OF PREPARING SAME

Teruo Miyata, Tokyo, and Toshio Taira, Kawasaki, both of Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,253

Claims priority, application Japan, Jul. 27, 1983, 58-137007

Int. Cl.[4] A61K *37/00*; C07K *15/20*

U.S. Cl. 530—356 **8 Claims**

1. An aqueous atelocollagen solution comprising dissolved atelocollagen, having a pH in the range from about 6.5 to about 8.0 and an osmolality in the range from about 250 to about 320 mOsm/KgH_2O.

4,592,865

AZETIDINONE INTERMEDIATES FOR CEPHALOSPORIN ANALOGS

Masayuki Narisada; Hiroshi Onoue; Teruji Tsuji; Yasuhiro Nishitani; Mitsuru Yoshioka, all of Osaka; Yoshio Hamashima, Kyoto, and Wataru Nagata, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

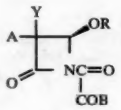
Division of Ser. No. 322,663, Nov. 18, 1981, abandoned, which is a continuation of Ser. No. 134,134, Mar. 26, 1980, abandoned, which is a continuation-in-part of Ser. No. 28,323, Apr. 9, 1979, abandoned, which is a continuation of Ser. No. 823,175, Aug. 8, 1977, abandoned. This application Mar. 13, 1984, Ser. No. 589,670

Claims priority, application United Kingdom, Aug. 9, 1976, 33109/76; Jun. 30, 1977, 27511/77

Int. Cl.[4] C07D *205/08, 405/12, 498/04, 403/12*

U.S. Cl. 260—239 A **7 Claims**

1. A compound of the formula



wherein

A is amino or acylamino selected from

(1) phenylacetamido,

(2) phenoxyacetamido,

(3) benzamido,

(4) thienylacetamido,

(5) α-hydroxy- or (C_1 to C_5)alkanoyloxy-α-phenylacetamido,

(6) N-t-butoxycarbonyl-α-phenylglycinamido,

(7) α-phenylmalonamido,

(8) N-(4-ethyl-2,3-dioxopiperazin-1-yl)carbonyl-α-phenylglycinamdio,

(9) (C_1 to C_5)alkoxycarbonylamino,

(10) cyclohexyloxycarbonylamino,

(11) cyclopropylmethoxycarbonylamino, and

(12) methanesulfonylethoxycarbonylamino,

COB is carboxy or protected carboxy selected from those forming

(C_1 to C_5)alkyl esters,

(C_2 to C_{10})alkanoylalkyl esters,

(C_1 to C_5)haloalkyl esters,

(C_2 to C_{10})alkoxyalkyl esters,

(C_1 to C_{10})aminoalkyl esters,

monocyclic aryl esters,

mono- or bicyclic aralkyl esters,

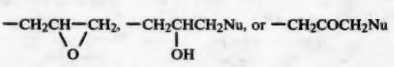
N,N′-diisobutylhydrazide,

alkali metal salts,

alkaline earth metal salts, and

(C_1 to C_6)alkylamine salts;

R is a group represented by the formula:



wherein Nu is a nucleophilic group selected from hydroxy, (C_1 to C_5)alkoxy, (C_1 to C_5)alkylthio, (C_1 to C_5)alkanoyloxy, (C_1 to C_5)alkanoylthio, monocyclic arylthio, monocyclic aralkylthio, tetrazolylthio, (C_1 to C_5)alkyltetrazolylthio, (C_1 to C_5)alkoxycarbonylmethyltetrazolylthio, thiadiazolylthio, (C_1 to C_5)alkylthiadiazolylthio and triazolylthio

and

Y is hydrogen or methoxy.

4,592,866

FUSED AROMATIC OXAZEPINONES, THIAZEPINONES, DIAZEPINONES AND SULFUR ANALOGS THEREOF

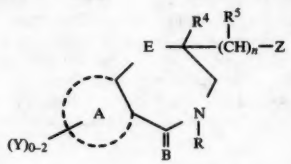
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 652,058, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,559, Aug. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 431,500, Sep. 30, 1982, abandoned. This application Jun. 18, 1985, Ser. No. 746,091

Int. Cl.[4] C07D *281/08, 267/14, 419/14, 498/04*

U.S. Cl. 260—239.3 T **222 Claims**

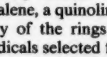
1. A compound selected from the group having the formula:



wherein;

A represents an aromatic ring having two of its carbon atoms held mutually with the oxazepine, thiazepine, or diazepine moiety selected from the group consisting of benzene, naphthalene, a quinoline, or a pyridine in any of its four positions, any of the rings optionally substituted by one or two Y radicals selected from the group consisting of halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro, or trifluoromethyl;

E is selected from oxygen, sulfur or



B is selected from oxygen or sulfur;

R is selected from the group consisting of hydrogen loweralkyl, cyclic alkyl containing 3–9 carbon atoms or phenyl-loweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro, or trifluoromethyl;

n is 1, 2 or 3;

R^4 and R^5 are selected from hydrogen or loweralkyl (1–5C);

Z is selected from the group consisting of —NR^1R^2; 1H-pyrazol-1-yl, 1H-imidazol-1-yl, 1H-imidazol-2-yl or 4,5-dihydro-1H-imidazol-2-yl;

R^1 and R^2 are selected from the group consisting of hydrogen,

loweralkyl, cyclic alkyl containing 3–9 carbon atoms and phenyl-loweralkyl of which phenyl may be optionally substituted by 1 or 2 radicals selected from halo, loweralkyl, loweralkoxy, nitro, trifluoromethyl or cyano, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-azetidinyl, 1-pyrrolidinyl, 2,5-dimethylpyrrolidin-1-yl, 2-methylpyrrolidin-1-yl, 1-piperidinyl, 4-substituted piperidine-1-yl, 4-[bis(4-fluorophenyl)methyl]-piperidin-1-yl, 4-morpholinyl, 1-piperazinyl, 4-substituted piperazin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 1H-pyrrol-1-yl or 2,5-dihydro-1H-pyrrol-1-yl; the optical isomers thereof and the pharmaceutically acceptable salts thereof with the proviso that when R=H, Z is never a primary or secondary amine and a further proviso that when n=3, Z is not pyrazolyl or imidazolyl.

84. The compound of claim **1** which is 2-[2-dimethylamino)ethyl]-2,3-dihydro-4-methyl[1,4]-oxazepino[6,7-b]quinolin-5(4H)-one or a pharmaceutically acceptable salt thereof.

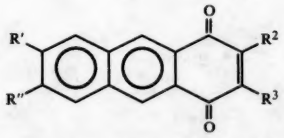
4,592,867

SYNTHESIS METHOD FOR REDUCTANT PRECURSOR

Terry T. Yu, Mt. Clemens, and Mei-Rong Yen, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 19, 1984, Ser. No. 662,683
Int. Cl.[4] C07C *50/10, 50/16, 50/22, 50/24*
U.S. Cl. 260—351.1 **15 Claims**

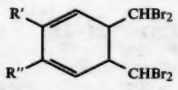
1. A method of synthesizing an anthraquinone of the formula:



(15)

where R^2 is lower alkoxy, R^3 is lower alkoxy, chloro, bromo or hydrogen, R′ and R″ each and independently are hydrogen, lower alkyl or phenyl, comprising:

(a) reacting the compound

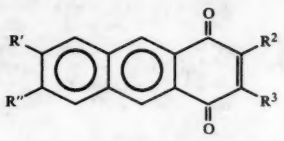


with potassium iodide;

(b) reacting a 2-alkoxy-1,4-benzoquinone where the lower alkoxy corresponds to R^2 with the reaction mixture from (a) to form the corresponding 2-alkoxy-1,4-anthraquinone;

(c) thereafter, if R^3 is lower alkoxy, chloro or bromo reacting the corresponding 2-alkoxy-1,4-anthraquinone with a halogen selected from the group consisting of chlorine and bromine to form 2-alkoxy,3-halo-1,4-anthraquinone; and

(d) thereafter, if R^3 is lower alkoxy, reacting the 2-alkoxy,3-halo-1,4-anthraquinone with X—O R^4, where X is an element selected from the group consisting of lithium sodium and potassium and —O R^4 corresponds to the lower alkoxy represented by R^3, to form the anthraquinone:



where R^2 is lower alkoxy and R^3 is lower alkoxy corresponding to —O R^4.

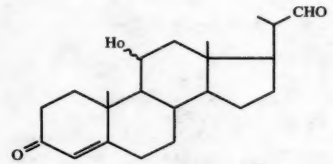
4,592,868

11-HYDROXYPREGN-4-EN-3-ONE-20-CARBALDEHYDE AND A METHOD FOR ITS PRODUCTION

Masao Tsuji; Fumio Mori, and Yoshihiro Ichihara, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 7, 1984, Ser. No. 607,458
Claims priority, application Japan, May 9, 1983, 58-81235
Int. Cl.[4] C07B *29/02;* **C07J** *9/00*
U.S. Cl. 260—397.1 **2 Claims**

1. A compound of the formula



wherein the wavy line ~ denotes that the indicated hydroxy group is either in the α- or in the β-configuration.

4,592,869

SELECTIVE ACYLATION PROCESS

Sten K. Kristensson, and Anders R. Stamvik, both of Helsingborg, Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Filed Sep. 28, 1984, Ser. No. 655,950
Claims priority, application Sweden, Oct. 12, 1983, 8305596
Int. Cl.[4] C07J *1/00*
U.S. Cl. 260—397.4 **23 Claims**

1. A selective acylation process for the preparation of phenolic N-disubstituted carbamate esters of steroids, comprising reacting in an inert solvent an acylating agent which is a carbamol halogenide plus a 4-(tertiary amino)-pyridine, or a complex of the two, and a steroid having a cyclopentanopolyhydrophenanthrene carbon-carbon skelton and having at least two free hydroxy groups attached to different carbon atoms of the carbon-carbon skeleton, at least one being phenolic and at least one being alcoholic, thereby to selectively acylate the phenolic hydroxy group.

4,592,870

PRODUCTION OF METHYL ESTERS AND ETHYLENE GLYCOL ESTERS FROM REACTION OF CARBON MONOXIDE AND HYDROGEN IN PRESENCE OF RUTHENIUM CATALYST

Bernard D. Dombek, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 971,667, Dec. 21, 1978, abandoned. This application Nov. 10, 1981, Ser. No. 319,887
Int. Cl.[4] C09F *5/08;* **C07C** *67/08*
U.S. Cl. 260—410.6 **2 Claims**

1. The process for producing methyl and ethylene gylcol esters which comprises reacting carbon monoxide and hydrogen in a homogenous liquid phase mixture comprising a ruthenium carbonyl complex, an acyl compund selected from the

group consisting of a carboxylic acid, a carboxylic acid anhydride and mixtures thereof, and a cosolvent which in combination with the acyl compound increases the yield of said ethylene glycol esters at a temperature of between about 50° C. and about 400° C. and a pressure of between about 500 psia. and about 12,500 psia. for a period of time sufficient to produce such esters as the predominant product.

4,592,871

N-IMIDOYLTHIO(METHYL)CARBAMATES

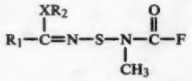
Fred E. Dutton, and Stephen J. Nelson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 436,245, Oct. 25, 1982, Pat. No. 4,473,580. This application May 31, 1984, Ser. No. 616,504

Int. Cl.[4] C07C *149/14, 119/16*

U.S. Cl. 558—2 **11 Claims**

1. A compound having the formula



II

wherein R_1 and R_2 are the same or different and are selected from the group consisting of alkyl of from one to ten carbon atoms, inclusive, phenyl, substituted phenyl comprising lower-alkyl-, lower-alkoxy-, halogen-, nitro-, or cyano-substituted phenyl, phenyl substituted lower-alkyl, and cycloalkyl; and X is oxygen or sulfur.

4,592,872

PROCESS FOR THE SYNTHESIS OF α-CHLORINATED CHLOROFORMATES

Guy C. Cagnon, Ballancourt; Marc D. Piteau, Itteville; Jean-Pierre G. Senet, La Chapelle, all of France; Roy A. Olofson, and Jonathan T. Martz, both of State College, Pa., assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Division of Ser. No. 260,907, May 6, 1981. This application Jan. 22, 1982, Ser. No. 341,893

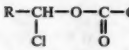
Claims priority, application France, May 14, 1980, 80 10806

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] C07C *68/02, 69/96*

U.S. Cl. 558—281 **8 Claims**

1. The process for the synthesis of α-chlorinated chloroformates of the formula:



wherein: R is alkyl of 1 to 4 carbon atoms, or R is—CCl_3 which consists of reacting phosgene with an aldehyde of formula RCHO, wherein R has the same meaning as above in the presence of 1–10% mole of a catalyst which is a member selected from the group consisting of pyridine, N,N-dimethylaminopyridine, imidazole, tertiary aliphatic phosphines, and a member of the group of amides, ureas, thioureas, phosphoramides wherein the N atoms are completely substituted by alkyl groups and the products of reactions of these catalysts with phosgene.

4,592,873

SULFUR-CONTAINING HALOGENATED ESTERS OF NEOPENTYL ALCOHOL AND METHODS FOR THEIR PREPARATION

Avraham Teuerstein, Omer; Rubin Scharia, Beer-Sheva, and Milon Sprecher, Ramat-Gan, all of Israel, assignors to Bromine Compounds, Ltd., Beer-Sheva, Israel

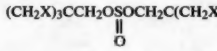
Filed Jan. 9, 1985, Ser. No. 689,837

Claims priority, application Israel, Feb. 29, 1984, 71108

Int. Cl.[4] C07C *137/00*

U.S. Cl. 558—59 **5 Claims**

1. A sulfite ester of halogenated neopentyl alcohol having the formula



wherein each X is independently Br or Cl.

4,592,874

PROCESS FOR THE SYNTHESIS OF ALPHA-CHLORINATED CHLOROFORMATES

Guy C. Cagnon, Ballancourt; Marc D. Piteau, Itteville; Jean-Pierre G. Senet, La Chapelle, all of France; Roy A. Olofson, and Jonathan T. Martz, both of State College, Pa., assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed May 6, 1981, Ser. No. 260,907

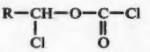
Claims priority, application France, May 14, 1980, 80 10806

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] C07C *68/02, 69/96*

U.S. Cl. 558—283 **15 Claims**

1. The process for the synthesis of α-chlorinated chloroformates of the formula



wherein: R is alkyl of 1 to 4 carbon atoms or R is =CCl_3 which consists of reacting phosgene with an aldehyde of formula RCHO, wherein R has the same meaning as above in the presence of a catalyst which is a member selected from the group consisting of (a) quaternary ammonium, phosphonium or arsonium halogenide, wherein the hydrocarbyl radicals attached to the N, P or As atom comprise together at least 16 carbon atoms, and (b) metal halogenides associated with a crown ether or a cryptand.

4,592,875

ALKOXYLATED ETHER SULFATE ANIONIC SURFACTANTS FROM PLASTICIZER ALCOHOL MIXTURES

Haven S. Kesling, Jr., Drexel Hill, and Hyman D. Gillman, Spring City, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 25, 1984, Ser. No. 624,324

Int. Cl.[4] C11D *1/14;* C07C *141/02*

U.S. Cl. 252—551 **17 Claims**

1. A water-soluble, liquid admixture of alkoxylated ether sulfate anionic surfactants corresponding to the formula:

$$RO[CH_2CH(R')O]_mZ_nSO_3M$$

wherein R is a straight or branched hydrocarbon alkyl radical containing of from about 4 to 11 carbon atoms; R' is a member selected from the group consisting of methyl and ethyl; m is an integer of from 6 to 12; Z is a oxyethylene group or a random mixture of oxyethylene groups and oxyalkylene groups present in the radical —$CH_2CH(R')O$—, the molar ratio of oxyethylene to oxyalkylene groups in said mixture being such that the

total molar ratio of oxyethylene to oxyalkylene groups in said formula is from about 1:1 to 1:10; n is an integer of from 0 to 4; and M is hydrogen, an alkali metal, an alkaline earth metal; ammonium or a primary, secondary, or tertiary amine or quaternary ammonium ion, said admixture of surfactants being characterized as containing at least two of said surfactants present within a molar ratio of between about 4:1 and 1:4.

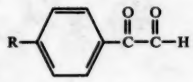
4,592,876

ARYLGLYOXALS

Middleton B. Floyd, Jr., Suffern, N.Y., and Vern G. DeVries, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 461,337, Jan. 27, 1983, Pat. No. 4,474,810. This application Jul. 16, 1984, Ser. No. 631,428
Int. Cl.⁴ C07C *33/34, 33/36, 143/16, 49/784*
U.S. Cl. 260—511 **5 Claims**

1. A compound selected from the group consisting of those of the formula:



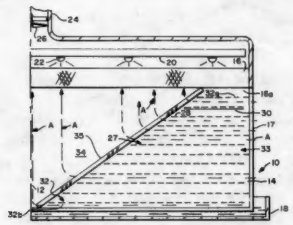
wherein R is 1-naphthyloxy, 4-chloro-1-naphthyloxy or 4-chloro-2-naphthyloxy, the hydrates thereof and the sodium bisulfite adducts thereof.

4,592,877

COOLING TOWER WITH PARTIALLY FILLED AIR INLET PLENUM

Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904

Filed Aug. 12, 1985, Ser. No. 764,350
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—109 **16 Claims**



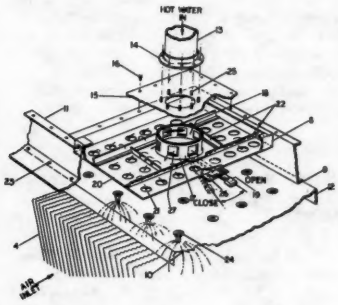
1. A cooling tower comprising:
(a) at least one upright outer wall means having at least one gas inlet opening,
(b) a gas outlet opening,
(c) counterflow film fill means having upper and lower surfaces mounted in said tower to extend in a generally horizontal direction and intersecting a path between said gas inlet and gas outlet openings,
(d) means for supplying a gravitating liquid to the counterflow film fill means upper surface, and
(e) splash fill means mounted in said tower and extending below said counterflow film fill means in the cooling tower inlet plenum to intersect the path between said gas inlet and outlet openings, said splash fill means including at least one inner side sloping from its top adjacent to an outboard portion of said film fill means to extend generally downwardly in an inboard direction; said cooling tower defining a generally open central chamber with one sloping side generally conforming to the slope of said sloping splash fill means inner side.

4,592,878

ROTARY FLOW CONTROL BALANCING VALVE FOR CROSS-FLOW COOLING TOWERS

Warren A. Scrivnor, Catonsville, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Sep. 28, 1984, Ser. No. 655,498
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—111 **10 Claims**



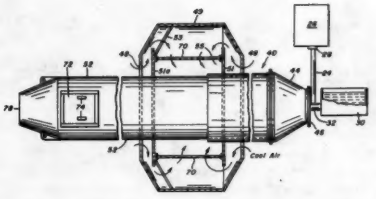
1. An evaporative heat and mass exchange apparatus with a hot water inlet to a gravity water distribution system to a fill material wherein ambient air is forced over the surface of the fill by air distribution means to cause evaporative cooling of the water as it proceeds to the cold water sump, comprising a rotary flow control balancing valve located within a predistribution box with said hot water inlet affixed to the top of said predistribution box allowing water to pass therethrough, said valve comprising a cylindrically shaped stationary portion affixed to the predistribution box, and a concentrically arranged movable portion, both portions of a height substantially equivalent to the inside height of said predistribution box, with both portions having holes therethrough, said movable portion being provided with control means for progressive rotation of said movable portion within or about said stationary portion to increase or decrease water flow through those sections of the holes of the stationary and movable portions which are in alignment, to allow water to flow onto the bottom of the predistribution box and thence into the gravity distribution system.

4,592,879

METHOD FOR THE CONTROL OF PARTICLE SIZE IN THE PRODUCTION OF ATOMIZED METAL

Robert A. Ramser, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 440,967, Nov. 12, 1982, Pat. No. 4,449,902. This application Nov. 2, 1984, Ser. No. 595,950
Int. Cl.⁴ B29B *9/02*
U.S. Cl. 264—12 **6 Claims**



6. A method for controlling the particle size of atomized metal particles which comprises the steps of:

(a) providing a source of molten metal in a reservoir;
(b) introducing said molten metal from said reservoir to a containment vessel in a flow of finely divided particles and atomizing gas through nozzle means sealed to an end plate in said vessel whereby an end portion of said vessel is sealed off from said reservoir;
(c) introducing a sweeping gas into said vessel through an ingress port which provides an open entry into said vessel for air to be brought from the outside into said vessel to sweep said particles from said containment vessel; and
(d) adjusting the pressure of the molten metal entering said vessel from said reservoir through said nozzle means to compensate for changes in the operating pressure in said vessel caused by said air being either pushed or pulled into said vessel to thereby control the particle size of the atomized metal produced in said containment vessel.

4,592,880

PROCESS FOR PRODUCING A PIEZO- AND PYRO-ELECTRIC FILM

Kunio Murakami, Uji, Japan, assignor to Unitika Ltd., Amagasaki, Japan

Filed Jul. 3, 1984, Ser. No. 627,552
Claims priority, application Japan, Jul. 7, 1983, 58-124148
Int. Cl.[4] B29C *71/04, 55/12;* **H04R** *17/00*
U.S. Cl. 264—22 **11 Claims**

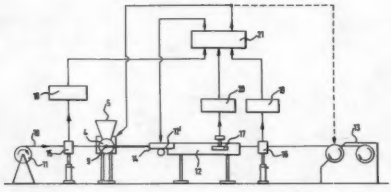
1. A process for producing a piezo- and pyro-electric film having high strength and without great anisotrophy in the Piezo-electric characteristics, which comprises biaxially stretching a single- or multi-layered thermoplastic film containing from 3 to 80% by volume, as an average based on the entire film, of a ferroelectric substance such that during the biaxial stretching, particles of the ferroelectric substance are subjected to the shearing stress resulting from molecular chain orientation of the thermoplastic resin of the film and undergo a change in their state from a randomly dispersed state in the non-stretched film to an oriented state as stretched, then subjecting the stretched film to polarization by applying a high voltage at a temperature within a range of from 10° C. to a temperature lower than the melting point of said thermoplastic resin, and cooling the film while continuously applying the high voltage.

4,592,881

METHOD FOR CONTROLLING A FOAM RESIN CABLE COATING EXTRUSION PROCESS

John Kyriakis, Harrow, England, assignor to Beta Instrument Company Limited, Buckinghamshire, England

Filed Nov. 15, 1983, Ser. No. 551,900
Claims priority, application United Kingdom, Nov. 15, 1982, 8232556
Int. Cl.[4] B29C *47/92, 47/02, 67/22*
U.S. Cl. 264—40.1 **4 Claims**



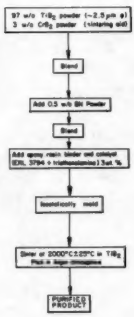
1. A method of controlling a cellular foam coating extrusion process comprising measuring the error in relative permittivity of an extruded foamed coating between a required permittivity of the coating and actual permittivity of the coating to provide a first error signal indicative thereof, measuring the error in the annular area of the extruded foamed coating between the required annular area of the coating and actual annular area of the coating to provide a second error signal indicative thereof, including correcting measured values of said actual annular area for any measured error in the required relative permittivity of the foamed coating at the time of measurement, and simultaneously adjusting, in response to the first and second error signals, respectively, a quench point or an extrusion temperature of the foamed coating being extruded, and the ratio of speed of extrusion to line speed of the extrusion process, so as to nullify both of said first and second error signals, respectively.

4,592,882

METHOD OF MAKING ALUMINUM-RESISTANT TITANIUM DIBORIDE ARTICLES

Lien N. Parrish, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 480,516, Mar. 30, 1983, abandoned.
This application Apr. 16, 1984, Ser. No. 600,899
Int. Cl.[4] C04B *35/64, 35/56;* **C01B** *35/04;* **F27B** *9/04*
U.S. Cl. 264—66 **5 Claims**



3. A method for making a shaped TiB_2 article essentially free of TiO, TiN and TiC cubic phase impurities comprising forming said article from finely divided TiB_2 containing at least one of said impurities and a sintering aid; sintering said article between about 1600° C. and about 2100° C.; and annealing said article in a BN pack between about 1700° C. and about 1900° C. thereby reacting said impurities with said pack so that essentially none of said impurities is present in said article after annealing.

4,592,883

PROCESS FOR TREATING MOLDED, POROUS CARBON ARTICLE

Okimasa Yamada, Kitaibaraki, Japan, assignor to Nippon Mektron Ltd, Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,888
Claims priority, application Japan, Oct. 21, 1983, 58-197442
Int. Cl.[4] C04B *40/00;* **C01B** *31/00*
U.S. Cl. 264—82 **4 Claims**

1. A process for improving the surface frictional resistance of a molded porous carbon article with pores having pore sizes of about 1 μm to about 30 μm and a porisity of about 1% to about 20% which comprises treating said article in a stream or atmosphere of fluorine gas at a temperature of about 10° C. to about 200° C.

4,592,884

METHOD FOR MAKING SPECIMEN CONTAINERS

Loronzo H. Thomson, Warner Robins, Ga., assignor to Little Rapids Corp., Green Bay, Wis.

Filed Mar. 12, 1984, Ser. No. 588,685
Int. Cl.[4] C04B 41/16
U.S. Cl. 264—132 4 Claims

1. The method for making a reclosable container for a patient's specimen with improved assurance that, once a specimen has been introduced into the container and the container then closed, the identity of the patient will not be lost, comprising

molding from polymeric material as separate pieces both a hollow container body and a removable cover for closing the body,

the container body having a side wall and a pouring spout which projects outwardly from the upper end portion of the side wall, the side wall including an outer surface portion constituting a display area located below the pouring spout,

the cover being constructed and arranged to close the entire upper end portion of the container body including the pouring spout,

the upper surface of the cover constituting a display area;

delivering the container body and cover to an assembly station and, at the assembly station, applying the cover to the container body with the cover occupying a predetermined position relative to the body, in which position the cover closes the container body against spillage;

applying to the upper surface of the cover first permanent characteristic identifying indicia;

applying to the display area of the side wall of the container body second permanent identifying indicia,

the first and second indicia being applied in predetermined locations while the cover remains in said predetermined position relative to the container body; and

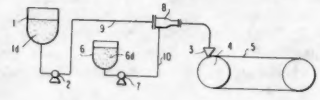
delivering the container body, with the cover still in place thereon, to a packaging station and packaging the container without removal of the cover.

4,592,885

FILM MANUFACTURING METHOD FOR IMPROVED SURFACE SMOOTHNESS

Shuichi Ichino; Zenichi Higuchi, and Motoharu Kuroki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 263,803, May 14, 1981, abandoned. This application Sep. 20, 1983, Ser. No. 533,890
Claims priority, application Japan, May 20, 1980, 55-66876
Int. Cl.[4] B29C 47/04
U.S. Cl. 264—171 1 Claim



1. A method for manufacturing film comprising the steps of:

extruding a high viscosity polymer solution through a die slit onto a plane adapted for running and spreading of said polymer solution thereon;

simultaneously extruding through said die slit a low viscosity solution wherein said low viscosity solution covers said high viscosity solution; and

wherein, for improving the surface smooothness and production efficiency of the resultant film:

(a) the viscosity of said high viscosity polymer solution is in a range of 3,000 poise to 100,000 poise,

(b) the viscosity of said low viscosity solution is in a range of 1 poise to 3,000 poise,

(c) the viscosity ratio of said high viscosity polymer solution to said low viscosity solution is equal to 5 or more, and

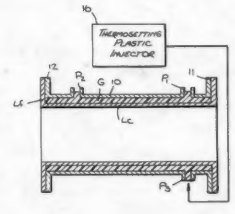
(d) the amount of said low viscosity solution is no more than 10% of the total amount of said extruded solution.

4,592,886

TECHNIQUE FOR STABILIZING INJECTION MOLDED FLOWMETER LINER

Elmer D. Mannherz, Southampton, Pa., assignor to Fischer & Porter, Warminster, Pa.

Filed Apr. 28, 1982, Ser. No. 372,717
Int. Cl.[4] B32B 31/06
U.S. Cl. 264—262 2 Claims



1. A method for producing a stabilized insulating liner in a flowmeter comprising the steps of first injection molding a thermoplastic material onto the inner surface of a metal spool having a cylindrical body provided with end flanges, said spool being provided with first and second ports placed on one side of the body adjacent the end flanges thereof and a third port on the opposite side of the body, the lined spool being adapted to conduct a pressurized fluid, a gap being created between the liner and the body due to differential shrinkage as the injection-molded thermoplastic liner cools and solidifies, the method further comprising the steps:

A. supporting the lined spool in a horizontal position with the third port on the bottom;

B. introducing a thermosetting resin curable at room temperature into the gap through the third port in the spool body to fill the gap therewith, the presence of resin in the first and second ports being indicative of the filled state, said resin not being subject to differential shrinkage during curing; and

C. curing the resin to form a filler in the gap to thereby maintain the internal diameter of the liner at a constant value regardless of varying fluid pressure.

4,592,887

METHOD OF PRODUCING SHAPED RESINOUS ARTICLES

Satoshi Bando, Kurashiki; Hirokuni Tanii, Nara, and Yoshio Ohfuji, Kyoto, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 14, 1982, Ser. No. 368,223
Claims priority, application Japan, Apr. 30, 1981, 56-66368
Int. Cl.[4] B29C 33/40
U.S. Cl. 264—337 15 Claims

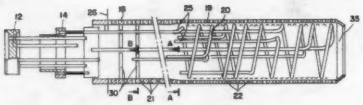
1. A method for producing a shaped resinous article exhibiting even surface gloss comprising pouring a liquid curable resin into a mold having a coating surface comprising a vinyl alcohol-olefin copolymer containing 40 to 90 mole percent of vinyl alcohol, curing said resin therein and removing the resulting shaped resinous article.

4,592,888

DEVICE FOR EMERGENCY REMOVAL OF THE HEAT DISSIPATED BY A FAST BREEDER NUCLEAR REACTOR WHEN SHUT DOWN

Bernard Cornu, Les Glayes Sous Bois, and René Lion, Saint-Cloud, both of France, assignors to Novatome, Le Plessis Robinson, France

Filed Nov. 16, 1982, Ser. No. 442,215
Claims priority, application France, Dec. 31, 1981, 81 24596
Int. Cl.[4] G21C *15/18*
U.S. Cl. 376—299 8 Claims



1. A device for the emergency removal of the heat dissipated by a fast breeder nuclear reactor when shut down, said reactor having a core composed of fuel assemblies, immersed in a liquid metal filling the reactor vessel and constituting the primary cooling fluid taking up the heat of the reactor, said heat removal device comprising at least one liquid-liquid heat exchanger composed of an external casing (**15**, **18**, **19**) open at its lower part and having openings in its wall immersed in said primary cooling fluid and enclosing a bundle (**20**) of tubes (**25**) fixed on at least one tube plate (**12**, **14**) inside said casing (**15**, **18**, **19**) and each comprising a rectilinear part, then a helically wound part and another rectilinear part and inside which a liquid circulates whose cooling is provided outside the casing of said heat exchanger, said external casing comprising an elongate cylindrical sleeve disposed with its axis vertical in said reactor vessel having a thickness such that it remains substantially undeformed under stresses, and said tubes constituting said bundle each comprising a vertical straight liquid input part and a vertical straight liquid return part extending parallel thereto along substantially the whole length of said tube in the vertical direction and held in position by a plurality of transverse cross-pieces fixed on an internal face of said casing and an intermediary helically wound part having only about one loop and a half, said loops of all the tubes of said bundle being disposed in substantially horizontal planes with their axes along the axis of said cylindrical sleeve and having a same diameter which is substantially equal to the internal diameter of said sleeve.

4,592,889

METHOD AND APPARATUS FOR THE PRESSING AND ALIGNMENT OF RADIALLY ORIENTED TOROIDAL MAGNETS

Herbert A. Leupold, Eatontown; Ernest Potenziani, II, Ocean; Joseph P. Klimek, South Amboy, and Arthur Tauber, Elberon, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1985, Ser. No. 714,602
Int. Cl.[4] B22F *5/00*
U.S. Cl. 419—66 9 Claims

1. Apparatus for pressing magnetic material into a substantially toroidal shape and producing a radially-aligned magnetic field therein comprising:

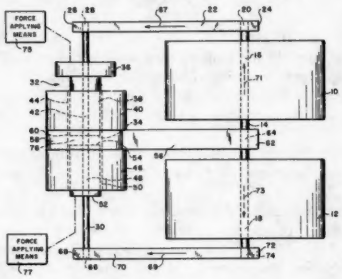
magnetic flux producing means;

magnetic circuit means coupled to said magnetic flux producing means and defining a closed magnetic circuit therewith, said magnetic circuit means having

a first portion defining a cavity, and

a second portion disposed in said cavity to create a substantially toroidal-shaped cavity through which the flux in said magnetic circuit passes in radially-aligned paths;

means for placing the magnetic material within the toroidal shaped cavity; and



means, disposed in said cavity, for compressing the magnetic material therein.

4,592,890

DENTAL PROSTHESES ALLOY

Arthur P. Burnett, and Wayne C. Bollinger, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Aug. 8, 1983, Ser. No. 521,485
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—442 14 Claims

1. An alloy composition consisting essentially of in weight percent about 78 to about 84 percent nickel, about 11 to about 15 percent chromium, about 3 to about 5 percent vanadium, and about 1 to about 2 percent beryllium.

4,592,891

CORROSION-RESISTANT COPPER ALLOY

Kiyoaki Nishikawa, and Ryoichi Nobuyoshi, both of Kanagawa, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 725,191
Claims priority, application Japan, Jun. 14, 1984, 59-120770; Jul. 26, 1984, 59-154110
Int. Cl.[4] C22C *9/00, 9/06*
U.S. Cl. 420—491 2 Claims

1. An corrosion-resistant copper alloy consisting essentially of 0.005 to 0.1 wt% lead; 0.01 to 1.0 wt% cobalt; and the remainder copper and inevitable impurities.

4,592,892

AQUEOUS STERILIZING AGENT FOR FOODS OR FOOD PROCESSING MACHINES AND UTENSILS

Ryuzo Ueno, Nishinomiya; Toshio Matsuda, Itami; Tatsuo Kanayama, Takarazuka; Munemitsu Yamamoto, and Ryoichi Hitotsuya, both of Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Nov. 8, 1982, Ser. No. 439,904
Claims priority, application Japan, Nov. 12, 1981, 56-180332; Jul. 23, 1982, 57-127644
Int. Cl.[4] A01N *59/26;* A23L *3/34;* A61L *2/18*
U.S. Cl. 422—28 34 Claims

1. A method of destroying microorganisms capable of spoiling food or causing food poisoning which comprises contacting surfaces which come into contact with food during the processing or handling thereof with an aqueous sterilizing agent having a pH of at least 10 and consisting essentially of an aqueous solution of about 0.5 to 75% by weight ethanol, an alkali carbonate selected from the group consisting of sodium carbonate and potassium carbonate, and a trialkali phosphate selected from the group consisting of trisodium phosphate and tripotassium phosphate, wherein the combined amount of

carbonate and phosphate, on an anhydrous basis, is from about 0.5 to 40% by weight, for at least 30 seconds, whereby the microorganisms are effectively destroyed without impairing the flavor or quality of the food which comes into contact with the sterilizing agent.

25. An aqueous sterilizing agent capable of effectively eliminating food spoilage and food poisoning microorganisms associated with foods and the processing equipment and utensils which come into contact with foods, said agent being an aqueous composition having a pH of at least 10 and consisting essentially of an aqueous solution of about 0.5 to 75% by weight ethanol, an alkali carbonate selected from the group consisting of sodium carbonate and potassium carbonate and a trialkali phosphate selected from the group consisting of trisodium phosphate and tripotassium phosphate wherein the combined amount of the carbonate and phosphate, on an anhydrous basis, is about 0.5 to 40% by weight, said agent being capable of being maintained in contact with the food to be sterilized for at least 30 minutes without reducing the flavor or quality of the food.

4,592,893

ANALYSIS TEST STRIP

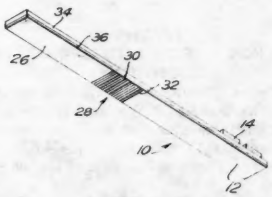
Werner Poppe, Bobenheim-Roxheim; Rainer van Rijekevorsel, Brühl; Uwe Rüppender, and Heinz Macho, both of Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 406,678, Aug. 9, 1982, Pat. No. 4,476,149. This application May 8, 1984, Ser. No. 608,324

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133826

Int. Cl.[4] G01N *33/52, 35/00*

U.S. Cl. 422—56 **10 Claims**



1. A test strip for the analysis of components of a liquid, comprising: an elongated carrier having a longitudinally axis and a handling region provided for facilitating handling of the strip; a test field region on one surface of the carrier, said test field region including at least one test field including test field material reactive with a component to be determined and obtained from a batch of test field material; and a machine-readable high information density bar code disposed on the carrier substantially transversely to the longitudinal axis thereof and including batch-specific information for the quantitative evaluation of the reaction of the test field.

4,592,894

FIELD EMISSION CHEMICAL SENSOR FOR RECEPTOR/BINDER, SUCH AS ANTIGEN/ANTIBODY

John A. Panitz, Edgewood, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 22, 1983, Ser. No. 554,415

Int. Cl.[4] H01J *1/34, 1/46;* **G01N** *33/53, 33/553*

U.S. Cl. 422—69 **13 Claims**

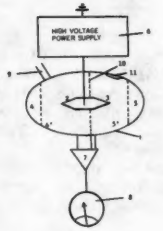
1. A field emission chemical sensor for specific detection in a liquid sample of molecular amounts of one component of a unique receptor/binder pair, wherein said receptor is a chemical binding partner only for said binder partner, said sensor comprising:

an active field emission electrode set comprising:

field-electron emission electrode means for field-emission of electrons; and

collector electrode means for capturing electrons emitted from said emission electrode;

a surface of said emission electrode means having bound thereto only one component of said receptor/binder pair; and



sample holding means for holding said liquid sample in simultaneous contact with both electrode means;

wherein the magnitude of the electrical current conducted in said sample is indicative of the presence of the other component of said receptor/binder pair contained in the liquid sample.

4,592,895

SINGLE CRYSTAL PULLING SYSTEM

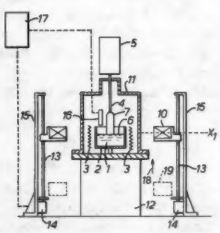
Kinya Matsutani, and Katsutoki Sasaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1984, Ser. No. 634,072

Claims priority, application Japan, Jul. 26, 1983, 58-136605

Int. Cl.[4] C30B *15/20*

U.S. Cl. 422—106 **6 Claims**



1. A single crystal pulling system comprising:

a single crystal pulling apparatus;

an electromagnet;

a magnet moving mechanism;

said single crystal pulling apparatus comprising a crucible containing a single crystal material melt, a heater for heating said crucible, and a constant speed pulling mechanism adapted to be coupled to a single crystal at a crystal-melt interface of said melt, said pulling apparatus adapted such that a seed crystal inserted in said melt is pulled from the melt at a specified constant speed by means of said constant speed pulling mechanism;

said electromagnet disposed at an outer periphery of said crucible so as to apply a predetermined strength of magnetic field to the crystal-melt interface of said melt; and

said magnet moving mechanism comprising means for moving said electromagnet at least in a vertical direction of vertical and horizontal directions with respect to said

crucible based on a level of said crystal-melt interface in said crucible;

wherein said magnet moving mechanism comprises:

means for detecting a change in level of the crystal-melt interface of said melt; and

means for moving said electromagnet in a vertical direction in accordance with the detected change in level of the crystal-melt interface of said melt, said moving means being connected to said detecting means.

4,592,896

COMBINATION STEAM AND UNSATURATED CHEMICAL VAPOR STERILIZER

Robert R. Runnells, Kaysville; Peter A. Haak, Salt Lake City; Rodney B. Larkin, Kaysville, and Keith Vandervelden, Salt Lake City, all of Utah, assignors to MDT Biologic Company, Gardena, Calif.

Division of Ser. No. 261,506, May 7, 1981, Pat. No. 4,447,399. This application Aug. 22, 1983, Ser. No. 525,168

Int. Cl.[4] G05D *16/00, 23/00*

U.S. Cl. 422—109 **3 Claims**

1. A temperature sensor/pressure relief valve having a sensing end and an exhaust end mounted to a pressure chamber of a sterilizer so that the sensing end is inside the chamber and the exhaust end is outside the chamber, comprising:

a hollow, impervious cylindrical housing having a first end comprising said sensing end with a terminal aperture of diameter less than the inside diameter of the housing, and an open second end comprising said exhaust end in communication with an ambient environment exterior to the chamber;

an impervious temperature sensor including means for electronically connecting it to interface circuitry means, said temperature sensor being slidably mounted within the housing near said sensing end so that it is positioned, selectively, to make contact with said terminal aperture, the cross-sectional diameter of the temperature sensor being less than the inside diameter of the housing to allow gases, vapors, fluids and steam to pass therebetween, but greater than the diameter of said terminal aperture, so that a seal is formed when the temperature sensor contacts said terminal aperture; and

means for urging the temperature sensor against the sensing end until the pressure within the pressure chamber exceeds a predetermined pressure, thereby causing the temperature sensor to separate from the terminal aperture, partially releasing sterilizing chemicals, fluids, vapors or steam through said terminal aperture to said ambient environment until the pressure is reduced to or below the predetermined pressure.

4,592,897

INPUT ASSEMBLY FOR HIGH-TEMPERATURE CHEMICAL REACTOR

Dale E. Schramm, and Oscar T. Scott, IV, both of Borger, Tex., assignors to J. M. Huber Corporation, Locust, N.J.

Filed Sep. 5, 1984, Ser. No. 647,959

Int. Cl.[4] B01J *1/00*

U.S. Cl. 422—145 **20 Claims**

1. A feed input assembly for directing a feed material into a heated zone of a high-temperature chemical reactor, comprising:

an elongate feed tube having an inlet opening at one end and a feed-discharge opening at an opposite end;

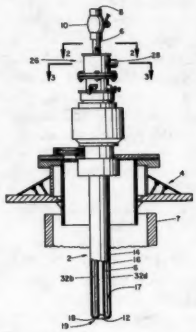
an outer cooling jacket surrounding a length of said feed tube extending from said feed-discharge opening;

an annulus between said cooling jacket and said feed tube defining a coolant channel for housing coolant;

a coolant channel inlet for introducing coolant into said channel;

a coolant channel outlet for discharging coolant from said channel;

a portion of said cooling jacket forming a feed-discharge tip adjacent said feed-discharge opening of said feed tube; and



conduit means positioned within said annulus for directing coolant against inner wall portions of said feed-discharge tip for cooling said feed-discharge tip and preventing deterioration of said feed-discharge tip or premature reaction of said feed material adjacent said feed-discharge tip due to high temperatures adjacent thereto when said feed tube is mounted within said reactor.

4,592,898

APPARATUS FOR VITRIFYING RADIOACTIVE WASTE SOLUTIONS

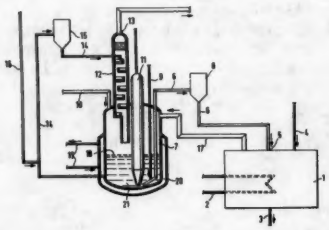
Friedrich Kaufmann, Hanover, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,527

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209250

Int. Cl.[4] G21F *9/16*

U.S. Cl. 422—159 **7 Claims**



1. Apparatus for vitrifying highly radioactive fission product present in liquid solution, the apparatus comprising:

a vitrifying oven;

a feed container for holding said liquid solution;

first pump means for moving quantities of said liquid solution from said feed container to said vitrifying oven wherein the fission product contained in said liquid solution is fixed in glass and offgas is generated, the offgas having radioactive dust particles and the like entrained therein;

conduit means for conducting said offgas into said feed container;

a counterflow scrubber communicating with said feed container for receiving the offgas supplied thereto via said conduit means;

second pump means for pumping at least a portion of said liquid solution from said container into said scrubber so as to cause said portion to flow through said scrubber and back into said feed container in a direction opposite to the flow of said offgas thereby scrubbing the radioactive dust particles and the like therefrom and transferring the same to said portion of said liquid solution; and,

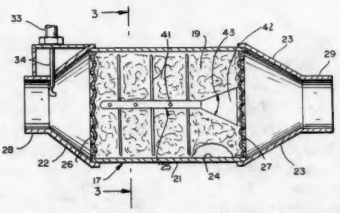
said scrubber having a drain communicating with said feed container whereby said portion of said liquid solution laden with said radioactive dust particles and the like flows back into said feed container.

4,592,899

SMOKE FILTER WITH FRANGIBLE SUPPORTED FILTER BED

Michael A. Caggiano, Chelsea, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1984, Ser. No. 686,552
Int. Cl.[4] F01N *3/10*
U.S. Cl. 422—180 **8 Claims**



1. A filter for treating a stream of hot exhaust gas which carries an amount of combustible particulate matter from an internal combustion engine, and which filter includes means to incinerate the said particulate matter into gaseous state prior to discharge of the treated exhaust gas into the atmosphere at the filter downstream end, said filter further including

an elongated casing which defines a reaction chamber having an inlet communicated with the source of said hot exhaust gas, and a casing outlet at said downstream end,

an internally reinforced filter bed positioned in said reaction chamber defining particulate retaining passages through which said hot exhaust gas flows,

said internally reinforced bed comprised of randomly disposed metallic fibers which are compacted into a resilient fibrous mass to form particulate retaining passages, and

a support member extending longitudinally of the internally reinforced bed, and including an elongated core piece, and a plurality of thin thermally conductive arms positioned at locations along the longitudinal axis of the support member and depending outwardly from said core piece into said fibrous mass.

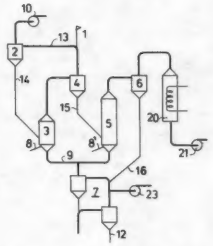
4,592,900

METHOD OF REMOVING CADMIUM FROM RAW PHOSPHATE

Soren Hundebol, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Mar. 8, 1985, Ser. No. 709,556
Claims priority, application Denmark, Mar. 9, 1984, 1537/84
Int. Cl.[4] C01B *25/26*
U.S. Cl. 423—167 **8 Claims**

1. A method of cleaning cadmium-containing raw phosphate material of its cadmium content in a multi-stage reactor plant comprising a preheater, first and second reactors working in series, of which said first reactor is a suspension reactor and said second reactor is a fluid-bed reactor, and a cooler for cooling product treated in said reactors; characterized by providing said first reactor with separate oxygen-containing gas and fuel supplies, said first reactor having a material retention time; providing said second reactor with an oxygen-containing gas supply which is not more than 20% of said gas supply to said first reactor, said second reactor having a material retention time which is at least three times said material retention time of said first reactor; preheating said raw phosphate material; introducing said preheated material into said first reactor to be suspended in a mixture of said gas and fuel



and heated to a reaction temperature of between 750° and 1050° C. in a flash-process during which the total amount of said fuel supply is used; passing said heated material suspension to a separator for precipitation of said heated material therefrom; passing said precipitated material to said second reactor to be subjected to further heat treatment in a non-oxidising atmosphere at a temperature which is not more than 100° C. higher than said reaction temperature in said first reactor, whereby said cadmium content is substantially driven off from said material and carried away from said second reactor together with exit gas therefrom while cleaned raw phosphate is discharged via said cooler.

4,592,901

METHOD OF REMOVING SUSPENDED SOLIDS FROM PHOSPHORIC ACID

Hudson C. Smith; Wesley W. Atwood; John S. Myrick, and Samuel F. Sweat, all of Lake City, Fla., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 206,785, Nov. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 827,741, Aug. 25, 1977, Pat. No. 4,235,854, which is a continuation of Ser. No. 744,229, Nov. 23, 1976, abandoned, which is a continuation of Ser. No. 571,855, Apr. 25, 1975, abandoned. This application Sep. 6, 1984, Ser. No. 647,981
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—320 **11 Claims**

1. A process for removing particulate impurities from phosphoric acid comprising the steps of:

(a) forming a filter cake comprising diatomite on a surface of a porous support member;

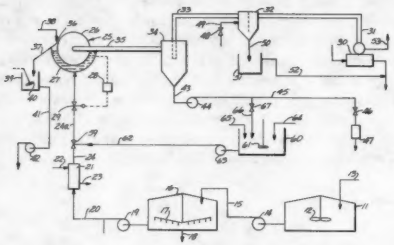
(b) maintaining phosphoric acid containing particulate impurities at a temperature no greater than about 77° C.;

(c) filtering said phosphoric acid through the formed filter cake, whereby said particulate impurities and some of the phosphate values in said phosphoric acid are retained by an outer portion of the filter cake;

(d) removing the impurity-containing outer portion of the filter cake to expose a fresh surface of the filter cake to the phosphoric acid which is being filtered;

(e) forming an aqueous slurry of said removed outer portion of said filter cake, said slurry comprising a liquid phase

containing phosphate values and a solid phase comprising diatomite and particulate impurities; and



(f) separating the liquid phase from the solid phase to recover a liquid containing a major portion of the phosphate values retained by the outer portion of the filter cake.

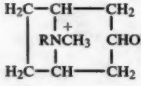
4,592,902

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-5 WITH AN ALKYLTROPINIUM COMPOUND PROMOTER

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 26, 1985, Ser. No. 705,819
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **21 Claims**

1. A method for preparing a crystalline silicate ZSM-5 exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises (i) preparing a mixture capable of forming said crystalline silicate, said mixture comprising sources of alkali metal cations (M), an oxide of silicon, water and alkyltropinium cations (R') having the formula:



wherein R is alkyl of 2 to 5 carbon atoms, said mixture having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3=20–20,000
H_2O/SiO_2=5–200
OH^-/SiO_2=0.001–2.0
M/SiO_2=0.005–4.0
R'/SiO_2=0.01–3.0,

(ii) maintaining the mixture at a temperature of at least 40° C. until crystals of said crystalline silicate are formed and (iii) recovering said crystalline silicate from step (ii), said recovered crystalline silicate containing alkali metal and said alkyltropinium cations.

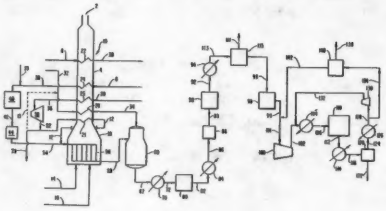
17. Alkyltropinium cation-containing Silicate ZSM-5, alkyl being ethyl, propyl, butyl or pentyl.

4,592,903

LOW SEVERITY HYDROCARBON STEAM REFORMING PROCESS

Robert M. Osman, Parsippany, and Robert G. Byington, Flanders, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 550,553, Nov. 10, 1983, abandoned.
This application Feb. 13, 1985, Ser. No. 701,120
Int. Cl.[4] C01C *1/04;* C01B *3/26;* C07C *1/02*
U.S. Cl. 423—359 **8 Claims**



1. In a process for producing ammonia which comprises:

(a) primary catalytically reforming at super atmospheric pressure in a direct-fired primary reforming zone, a hydrocarbon feedstock with steam to produce a gas containing carbon oxides, hydrogen and methane;

(b) secondary catalytically reforming the gas from step (a) by introducing air and bringing the mixture towards equilibrium thereby producing a secondary reformer effluent gas containing nitrogen, carbon oxides, hydrogen and a decreased quantity of methane;

(c) converting carbon monoxide catalytically with steam to carbon dioxide and hydrogen;

(d) removing carbon oxides to give an ammonia synthesis gas comprising nitrogen and hydrogen and compressing said gas to ammonia synthesis pressure;

(e) reacting the synthesis gas in an ammonia synthesis zone to produce ammonia and recovering ammonia from the reacted gas to produce an ammonia-depleted gas stream;

(f) recycling at least a portion of said ammonia-depleted gas stream to said ammonia synthesis zone; and

(g) treating a sidestream of said ammonia-depleted gas to separate a stream enriched in hydrogen and an inerts-enriched gas stream, and returning the enriched hydrogen stream to the ammonia synthesis zone;

the improvement which comprises:

(i) operaring step (b) at a temperature in the outlet gas of not greater than about 1735° F. and with an amount of air sufficient to provide from about 3 to 11 molar % excess N_2, and to form a secondary reformer outlet gas containing at least 0.8 vol. % methane;

(ii) operating step (e) under conditions sufficient to provide at least 10 volume percent inert gases in said ammonia-depleted gas stream; and

(iii) introducing as synthesis gas feed to the ammonia synthesis zone a mixture comprising the synthesis gas formed in step (d) having a methane content of at least about 1.2 mole % CH_4, on a dry basis, the recycled gas produced in step (f) plus the hydrogen-enriched gas stream formed in step (g), whereby the H_2 loss from the process with the separated inerts-enriched gas stream is minimized.

4,592,904

PROCESS FOR PRODUCING COLUMBIUM OXYFLUORIDE

Edwin J. Bielecki, Boyertown; C. Edward Mosheim, Hereford Township, Berks County, both of Pa., and Umedray L. Sheth, Mobile, Ala., assignors to Cabot Corporation, Boston, Mass.

Filed Feb. 22, 1982, Ser. No. 351,348

Int. Cl.[4] C01G *33/00*

U.S. Cl. 423—472 21 Claims

1. A process for the production of columbium oxyfluoride comprising;

heating to boiling in a reactor, with agitation, an aqueous feed solution containing hydrofluoric acid and dissolved columbium to thereby cause evaporation and hydrolysis of the aqueous feed solution to occur resulting in the formation of a columbium oxyfluoride-containing slurry, said agitation sufficient to maintain the hydrolyzed product in suspension; and

recovering the columbium oxyufluoride from the slurry, as formed, by separating the columbium oxyfluoride from the liquid phase of the slurry.

4,592,905

CONVERSION OF HYDROGEN SULFIDE TO SULFUR AND HYDROGEN

Mark A. Plummer, and Phillip M. Beazley, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jan. 14, 1985, Ser. No. 691,232

Int. Cl.[4] B01D *53/14;* C01B *17/05, 3/22*

U.S. Cl. 423—573 R 28 Claims

1. A process for converting hydrogen sulfide gas to sulfur and hydrogen gas comprising the steps of:

(a) contacting said hydrogen sulfide gas with an anthraquinone dissolved in a polar organic solvent;

(b) reacting said hydrogen sulfide gas with said anthraquinone to produce said sulfur and an anthrahydroquinone in said solvent;

(c) separating said sulfur from said solvent;

(d) dehydrogenating said anthrahydroquinone at a temperature of about 200° to about 350° C. to produce hydrogen gas and to regenerate said anthraquinone in said solvent; and

(e) recycling said anthraquinone in said solvent to step (a).

4,592,906

ULTRA-VIOLET ABSORBING COMPOUNDS AND COMPOSITIONS CONTAINING SAID COMPOUNDS

James A. Baker, Mold, Wales, assignor to Graesser Laboratories, Ltd., Wales, England

Filed Feb. 8, 1985, Ser. No. 699,955

Claims priority, application United Kingdom, Feb. 14, 1984, 8403836

Int. Cl.[4] A61K *7/44;* C07C *101/46*

U.S. Cl. 424—60 10 Claims

1. An ester of p-dimethylaminocinnamic acid selected from 2-ethylhexyl p-dimethylaminocinnamate and 2-octyl p-dimethylaminocinnamate.

5. A sunscreen composition for topical application comprising a dermatologically acceptable vehicle containing (a) as UVA absorber, an effective ultraviolet absorbing amount of an ester of p-dimethylaminocinnamic acid selected from 2-ethylhexyl p-dimethylaminocinnamate, 2-octyl p-dimethylaminocinnamate, and mixtures thereof, and (b) as UVB absorber, an effective ultra-violet absorbing amount of one or more dermatologically acceptable compounds absorbing in the erythemal range 280 to 320 nm.

4,592,907

HAIR-RINSE LIQUID WITH PEARLY LUSTER

Shin-ichi Akimoto, Machida, and Akinori Suginaka, Chigasaki, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,980

Claims priority, application Japan, Apr. 16, 1984, 59-76199

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 7 Claims

1. A hair-rinse liquid with pearly luster comprising

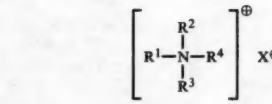
Component A: a cationic surface active agent expressed by the general formula (I), as given below,

Component B: an amine oxide represented by the general formula (II), as given below,

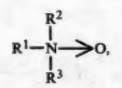
Component C: an amino acid having an isoelectric point not higher than 7 and

Component D: a salt of an alkali metal or alkaline earth metal,

wherein the weight ratio of A:B:C:D is 1:[0.1–10]:[0.01–2]:9 0.01–2],



(I)



(II)

wherein R^1, R^2, R^3 and R^4 each represent a hydrocarbon group or a hydroxyalkyl group having 1–24 carbon atoms, which are identical to or different from each other, wherein the sum of the carbon atoms in each formula is within the range of 16–45, and X denotes a halogen atom.

4,592,908

PROTECTIVE CREAM FOR THE SCALP AND METHOD OF STRAIGHTENING HAIR

Theodor Wajaroff, Darmstadt, and Helga Gallist, Gross-Gerau, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 466,011, Feb. 14, 1983, abandoned. This application Jan. 10, 1985, Ser. No. 691,590

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206204

Int. Cl.[4] A61K *7/09, 7/11, 7/06;* A45D *7/00*

U.S. Cl. 424—71 2 Claims

1. Method for straightening human hair, comprising the steps of applying to the scalp in uniform layers of about 1 to 2 mm thickness a cream for protection of the scalp during hair straightening, comprising

(A) 10 to 87% by weight of petroleum jelly;

(B) 10 to 85% by weight of oxyethylated C_8–C_{18}-fatty alcohol or an oxyethylated C_6–C_{14}-alkylphenol, each with from 2 up to 30 ethylene oxide units in the molecule;

(C) 0.5 to 5.0% by weight of an organic acid or the easily saponifiable ester thereof selected from the group consisting of acetic acid, tartaric acid, adipic acid, ascorbic acid, succinic acid, glutamic acid, maleic acid, citric acid, benzoic acid, lactic acid, sorbic acid, glycolic acid, salicylic acid, fumaric acid and sulfosalicylic acid;

(D) 0.001 to 1.0% by weight of a pH-indicator and

(E) up to 1% by weight of water; then distributing an effective amount of a strongly alkaline hair straightening agent containing 2 to 10% by weight of alkali hydroxide uniformly onto the hair, combing the hair for a time period of about 3 to 20 minutes and thereafter rinsing the hair thoroughly with water.

4,592,909

WATER BASED DRINK FOR PEOPLE ENGAGED IN ATHLETIC OR OTHER STRENUOUS ACTIVITY

Steven Winer, Boston, and William J. Evans, Cambridge, both of Mass., assignors to Water Marketers, Inc., Boston, Mass.

Continuation of Ser. No. 523,183, Aug. 15, 1983. This application Jun. 15, 1984, Ser. No. 620,854

Int. Cl.[4] A61K *33/00, 33/06, 33/14, 33/20*

U.S. Cl. 424—127 **2 Claims**

1. A fluid replacement drink for rapidly restoring bodily fluids and rapidly replacing physiologically important electrolytes in the proportions which they are lost during strenuous physical activity, consisting essentially of:

a. from about 0.006 to about 0.010 wt.% sodium chloride or from about 0.00900 to about 0.00150 wt.% sodium phosphate;

b. from about 0.0045 to about 0.0075 wt.% potassium chloride or from about 0.065 to about 0.0109 wt.% potassium phosphate;

c. from about 0.00375 to about 0.00613 wt.% calcium chloride; and

d. from about 0.000912 to about 0.000312 wt.% magnesium chloride; and

e. purified water; said electrolytes combined in an effective amount such that the osmolarity of said drink is not more than approximately 50–80 m. osm. per liter to ensure that the stomach is emptied of fluid and electrolytes at a controlled rate.

4,592,910

PREPARATION FOR DEACTIVATING VIRUSES AND PROCESS FOR PRODUCING SAME

Erich Wolf, Overath; Andreas Lembke, Eutin-Sielbeck, and Rolf Deininger, Cologne, all of Fed. Rep. of Germany, assignors to Chimicasa GmbH, Chur, Switzerland

Division of Ser. No. 184,135, Sep. 4, 1980, Pat. No. 4,402,950, which is a continuation of Ser. No. 5,764, Jan. 23, 1979, Pat. No.

Claims priority, application Luxembourg, Jan. 27, 1978, 78955

The portion of the term of this patent subsequent to Sep. 6, 2001, has been disclaimed.

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **19 Claims**

1. A process for preparing a pharmaceutical composition for deactivating viruses inside living human and animal organisms, comprising the steps of

deriving a terpene from black pepper oil by steam distillation; and

admixing said derived terpene in a pharmaceutical carrier in a mixing ratio of terpene to carrier of from about 1:100 to about 20:100.

4,592,911

EXTRACTION OF CAMOMILE WITH LIQUID CARBON DIOXIDE

Norbert Behr, Burgthann; Othmar von Ettingshausen, Düsseldorf; Reinhold Wüst, Kaarst, and Henk van der Mei, deceased, late of Rinteln, all of Fed. Rep. of Germany (by Jannette van der Mei née Reek, executrix), assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 348,308, Feb. 12, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 618,765

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105557

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **7 Claims**

1. A process for extracting heat labile substances having a molecular weight in excess of 150 from camomile comprising the steps of:

(a) contacting camomile with liquid carbon dioxide maintained at a pressure of from about 100 bar to about 400 bar above the saturation pressure of the carbon dioxide at the contact temperature for a contact time of from about 3 to about 5 hours and thereby extracting from the camomile heat labile substances having a molecular weight in excess of 150 including matricin, bisabolol and flavonoids; and

(b) separating the liquid carbon dioxide from the camomile extract dissolved therein by adjusting the pressure and/or temperature to gasify the liquid carbon dioxide.

4,592,912

ACHE AND PAIN RELIEVING AND PREVENTING COMPOSITION

Harriet Nickolaus, 519 E. Putnam Ave., Greenwich, Conn. 06830, assignor to Harriet Nickolaus, Greenwich, Conn.

Continuation-in-part of Ser. No. 546,875, Oct. 31, 1983, abandoned. This application Oct. 12, 1984, Ser. No. 660,225

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **20 Claims**

1. The aqueous extract of a heated composition comprising from about 92 to about 99.75 weight percent sterile water, from about 0.25 to about 6.0 weight percent capsicum from *Capsicum frutescens,* up to about 1.0 weight percent slippery elm and up to about 1.0 weight percent myrrh gum.

4,592,913

METHOD OF PRODUCING AN ARTIFICIAL TRUFFLE

Tatsuro Hara, Takarazuka, Japan, assignor to Sun Food Co., Ltd., Amagasaki, Japan

Filed Nov. 28, 1984, Ser. No. 675,712

Claims priority, application Japan, Dec. 1, 1983, 58-227243

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—104 **10 Claims**

1. A method of producing artificial truffles, comprising the steps of mixing approximately 7–15 parts by weight of sodium alginate, approximately 2.5 parts by weight of protein and approximately 1 part by weight of starch with water, kneading the mixture, forming the mixture into one or more balls resembling a truffle, immersing the ball in an approximately 3% soluble calcium salt solution for hardening, removing the ball from the solution after hardening, preparing a seasoning liquid by dissolving substantially 50 g of a seasoning composition comprising amino acids, substantially 1.5 g of truffle flavor, and substantially 1 g of sodium sorbate in substantially 1800 cc of water, and immersing the ball in said seasoning liquid for a period of time sufficient to impart smell and taste to said ball.

4,592,914

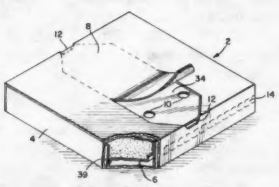
TWO-BLANK DISPOSABLE CONTAINER FOR MICROWAVE FOOD COOKING

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Greenwich, Conn.

Filed Jun. 15, 1983, Ser. No. 504,388

Int. Cl.[4] B65D *81/34, 5/00*

U.S. Cl. 426—107 **9 Claims**



1. A container for use in heating food in a microwave oven, comprising:

(a) outer package means constructed in a manner for containing and partially shielding food contained therein from microwaves and for providing an escape route for gas vapor generated during heating of the food; and

(b) food supporting means for supporting the food and pro-

vided with a microwave interactive layer for converting microwave energy to heat so as to crisp a surface of the food supported thereon;

wherein said food supporting means is formed of a central food support panel flanked by at least a pair of leg flaps that are connected to the central food support panel by respective fold lines; wherein said food supporting means is temporarily convertible from a flat configuration into a non-self-sustaining support tray configuration having said leg flaps folded relative to said central food support panel in an manner providing support leg portions extending downwardly with respect to the central food support panel and wall portions extending upwardly relative thereto;

wherein said food supporting means is retainable in said support tray configuration within said outer package means solely by virtue of the relative size and configuration of the outer package means relative to that of said food supporting means when it is in said support tray configuration; and

wherein said food supporting means is operative for converting back substantially into said flat configuration forming a cutting surface for the food when said food supporting means is removed, with the food thereon, from the outer packaging means after the food has been heated, due to the none-self-sustaining nature of said support tray configuration, wherein said leg flaps are laterally opposed multi-sectioned leg flaps, said laterally opposed multi-sectioned leg flaps being foldable into an upwardly open V-shape extending the length of side edges of said food support panel to which they are connected by said respective fold lines, so as to form supporting legs to raise said central food support panel above the bottom of said outer package means to insulate the bottom panel of the outer package means from heat generated during the microwave absorptive cooking process.

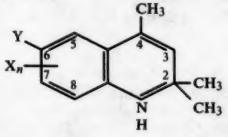
4,592,915

PROCESS AND COMPOSITIONS FOR STABILIZATION OF FORAGES

Lewis E. Goyette, 3806 Winding Way Rd., SW., Roanoke, Va. 24015, and James F. Tobey, Jr., Rte. 2, Box 293B, Roanoke, Va. 24019

Filed May 26, 1983, Ser. No. 498,320
Int. Cl.[4] A23J *3/03*
U.S. Cl. 426—321 **15 Claims**

1. A process for stabilizing against oxidation and mold growth a feedstuff selected from the group consisting of (1) silage, forage or grain, or high moisture grain; (2) baled hay of grasses or alfalfa; and (3) distillers wet or spent grains by adding to said feedstuff with blending a granulated composition comprising 1.0% to 5.0% of the compound



where

Y=OC_2H_5, H

X=Cl, Br, I or hydrogen

n=1-3

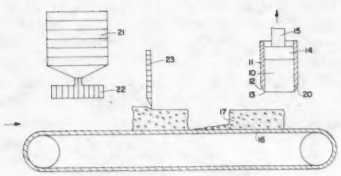
1.25% to 6.0% of an alkali metal or alkaline earth metal propionate, and 1.0% to 7.5% of sorbic acid or an alkali metal salt thereof, and the balance to 100% of inactive ingredients, said composition added to said foodstuff in amounts to provide a final level of individual ingredients in the amounts of quinoline compound 0.00125 to 0.00625%, sorbate 0.002 to 0.005% and propionate 0.00125 to 0.00375%, all percentages weight percent based on said foodstuff.

4,592,916

METHOD AND APPARATUS FOR FORMING CAKES

Yngve R. Akesson, Helsingborg, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 491,296, May 3, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,220
Claims priority, application European Pat. Off., May 3, 1982, 82103772
Int. Cl.[4] A21C *15/00*; A21D *13/08*; A23G *3/00*
U.S. Cl. 426—517 **8 Claims**



1. A method of forming a cake from a sticky confectionary material produced by adding a binder prepared by mixing 8 to 30 parts by weight of sucrose and/or glucose syrup and from 5 to 15 parts by weight of water, to a base in granular form prepared by mixing from 40 to 80 parts by weight of cereal flour, from 0 to 20 parts by weight of sucrose, from 0.5 to 3 parts by weight of oil or fat and from 0 to 3 parts by weight of water, and extrusion cooking under conditions such that an expanded cooked base having a density of from 0.1 to 0.3 g/cm^3 is obtained at the exit of an extrusion nozzle and reduced to granular form;

the method comprising the steps of depositing on an endless conveyor run intermittently said material in the form of plural bands of material extending transversely of said downstream direction, there being gaps between adjacent ones of such bands so that the bands and gaps are disposed in alternating sequence along the length of the conveyor, a scraper displacing material from the top of each such band into an adjacent one of said gaps as the band passes beneath the scraper upon movement of the conveyor to thereby form each band into a layer of substantially uniform thickness without unduly compressing the band and breaking the structure of the granules, transporting each layer to a position beneath at least one vertically disposed hollow cylinder whose wall is tapered at its lower end and inside which is a piston, advancing the cylinder downwardly so that it cuts through the sticky material until the lower edge of said cylinder contacts said surface and severs the sticky material within the cylinder from the layer, then advancing the piston downwardly to compress the severed sticky material to between about 40% and about 60% of its original thickness to form the cake, maintaining such compression for between 0.5 to 5.0 seconds, and then retracting the cylinder and piston together upwardly so that the cylinder and piston carry with them essentially without other means the formed cake, and then expelling and releasing the formed cake from the cylinder by advancing the piston downwardly.

8. An apparatus for forming cakes from a sticky confectionary granular material characterised in that it comprises an endless conveyor adapted to run intermittently in a predetermined downstream direction, above which is a vertically disposed hollow cylinder whose wall is tapered at its lower end and inside which is a piston, means for depositing a sticky confectionary material onto the endless conveyor upstream of the cylinder in the form of plural bands extending transversely of said downstream direction so that there are gaps extending transversely of said downstream direction

between adjacent ones of said bands, scraper means mounted above the conveyor belt downstream of said depositing means and upstream of the cylinder for engaging each of said bands of material and displacing excess material from the top of each band so engaged into the gap upstream of such band as such band passes beneath the scraper means upon movement of the conveyor, whereby each of said bands of sticky material is formed into a layer of uniform thickness without unduly compressing the sticky bands of material and breaking the structure of the granules, means for lowering the cylinder to cut through the sticky material until its lower edge contacts the endless conveyor, means for lowering the piston after the lower edge of the cylinder contacts the conveyor so that the piston compresses the sticky material to a thickness between about 40% and about 60% of the thickness of said layer to thereby form a cake, said piston lowering means being operative to maintain the pressure of the piston on the cake for between 0.5 and 5.0 seconds, means for raising the cylinder and piston together carrying with them the formed cake, means for lowering the piston to press out and release the formed cake and means for transporting the formed cake away from the endless conveyor.

4,592,917

CHICKEN FLAVORANTS AND PROCESSES FOR PREPARING THEM

John S. Tandy, Litchfield, Conn., assignor to Nestec S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 600,979, Apr. 16, 1984, abandoned. This application May 1, 1985, Ser. No. 729,275

Int. Cl.[4] A23L *1/231*

U.S. Cl. 426—533 10 Claims

1. A process for making a chicken flavorant comprising reacting

(a) a saccharide selected from the group consisting of reducing monosaccharides, reducing disaccharides, and combinations thereof,

(b) at least 0.5 parts by weight of leucine and/or its salts per part by weight of said saccharide, and

(c) an active sulfur-containing substance in an amount which provides more than 2 moles but not more than about 7 moles of active sulfur per mole of said saccharide,

in a reaction mixture including a hydroxylated solvent.

4,592,918

TAR-DEPLETED AQUEOUS LIQUID SMOKE COMPOSITION

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 417,171, Sep. 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 312,364, Oct. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 62,358, Jul. 31, 1979, abandoned. This application Nov. 30, 1983, Ser. No. 556,460

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

Int. Cl.[4] A23B *4/04;* A23L *1/221, 2/28*

U.S. Cl. 426—533 8 Claims

1. A natural wood-derived tar-depleted aqueous liquid smoke composition with smoke coloring and smoke flavoring capability, having an absorptive power of at least about 0.25 at 340 nm. wavelength, and having a light transmittance at 590 nm. wavelength of at least about 50%, said tar-depleted aqueous liquid smoke composition being totally miscible with water.

4,592,919

SOUFFLE COMPOSITIONS

William C. Winters, Bloomington, Minn., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1984, Ser. No. 687,525

Int. Cl.[4] A23L *1/187, 1/32*

U.S. Cl. 426—568 5 Claims

1. A souffle dry mix composition comprising,

Egg White Solids	20–40%
Powdered Vegetable Shortening	25–50%
Modified Food Starch	8–12%
Malto/Dextrin	5–15%
Dextrose	0–15%
Sucrose	0–15%
Salt	0–3%
Lactic Acid Powder	0–3%
Potassium Bitartrate	0.5–2.5%, and
Xanthan Gum	0.5–1.0%.

4,592,920

METHOD FOR THE PRODUCTION OF AN ANTIMICROBIAL CATHETER

Robert L. Murtfeldt, Redondo Beach, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 20, 1983, Ser. No. 496,367

Int. Cl.[4] B05D *3/02;* A01N *1/02;* A61M *5/325, 25/00*

U.S. Cl. 427—2 38 Claims

1. A method for the production of an antimicrobial catheter, the method comprising the steps of:

selecting a catheter from the group consisting of silicone catheters and latex catheters to be coated with an antimicrobial coating;

comminuting an antimicrobial metal compound to a particle size of up to about 30 microns in diameter;

suspending the comminuted antimicrobial metal compound in a curable suspending agent capable of bonding to the surface of the catheter;

coating the catheter with the suspending agent containing suspended antimicrobial metal compound; and

curing the suspending agent to bond the suspending agent containing antimicrobial metal compound to the surface of the catheter and to form an antimicrobial catheter.

4,592,921

METHOD FOR MONITORING AND REGULATING THE COMPOSITION AND THE LAYER THICKNESS OF METALLICALLY CONDUCTIVE ALLOY LAYERS DURING THEIR MANUFACTURE

Konrad Hieber, Bernau, and Norbert Mayer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,364

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1984, 3405559

Int. Cl.[4] B05D *3/12*

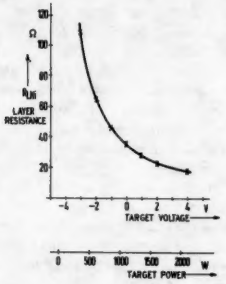
U.S. Cl. 427—9 11 Claims

1. A method for monitoring and regulating composition and layer thickness of metallically conductive alloy layers AB during their manufacture as a multifilm sandwich formed of materials A and B by means of electrical resistance measurement, the individual alloy components A and B being cyclically deposited in coatings in chronological succession, comprising the steps of:

(a) measuring a layer resistance of every layer of material A or B before and after the deposition and identifying at least one of the parameters coating resistance or ratio of coating resistance of layers A and B having a different material as an actual value;

(b) comparing this actual value to at least one of the corresponding parameters coating resistance or ratio of coating

resistances of layers A and B as determined before the layer production; and



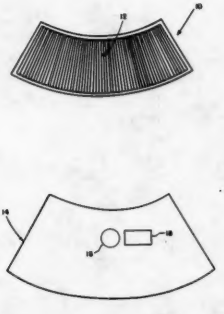
(c) given differences between the rated and actual values, varying coating rates of corresponding alloy component sources A and B until the actual values coincide with the rated values.

4,592,922

PLASMA SPRAY SCREEN REPAIR METHOD

Wallace J. Lewis, St. Louis County, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 15, 1985, Ser. No. 711,936
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34 **1 Claim**



1. A high temperature method of repairing a small damage site in a fine mesh fuel cell screen using plasma spray, comprising the steps of:

bathing said screen in a pure argon gas atmosphere;

placing a mask into said screen, said mask having an opening therein slightly larger than the size of said damage site and overlapping said damage site with said opening in said mask;

applying a test wafer to said mask adjacent said opening in said mask, said test wafer being of a predetermined thickness;

applying to said damage site through said opening in said mask selected repair material in powder form via said plasma spray by means of a plurality of spray cycles, each cycle having at least a single spray pass over said damage site and over said test wafer on said mask, where each cycle is followed by a cooling period and where the number of passes employed is determined by the amount of accumulation of said repair material at said damage site, and

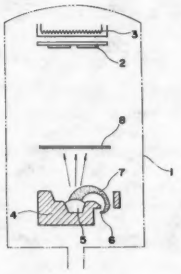
determining said amount of accumulated repair material on said damage site by removing said test wafer from said mask, measuring the total thickness of said test wafer and said repair material, and subtracting said predetermined thickness of said test wafer from said total thickness.

4,592,923

PRODUCTION METHOD OF A HIGH MAGNETIC PERMEABILITY FILM

Masaru Kadono, Nara; Kumio Nago, Nara; Shuuhei Tsuchimoto, Nara, and Mitsuhiko Yoshikawa, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1984, Ser. No. 664,425
Claims priority, application Japan, Oct. 24, 1983, 58-199727; Aug. 28, 1984, 59-181292; Aug. 29, 1984, 59-182087
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—35 **20 Claims**



1. A method for producing a high permeability alloy film comprising steps as follows:

irradiating an alloy material composed of 1–6 wt % Al, 20–35 wt % Si and the remainder of Fe with an electron beam in order to evaporate said material under vacuum,

depositing the vapor on a substrate for a predetermined time to form a high magnetic permeability alloy film thereon, and

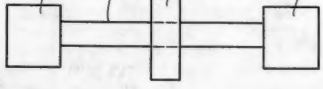
preventing the irregular deposition which takes place if the concentration of aluminum in the vapor begins to increase before said predetermined time has passed, and resuming the deposition after the concentration of aluminum in the vapor begins to decrease.

4,592,924

METHOD OF MANUFACTURING A REACTION VESSEL FOR CRYSTAL GROWTH PURPOSES

Paul D. Kuppers; Karl H. Schelhas, both of Aachen, Fed. Rep. of Germany; Cornelis H. J. van den Brekel, Nuenen, and Giok D. Khoe, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1984, Ser. No. 643,336
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330910
Int. Cl.[4] B05D *3/02, 7/22;* C23C *16/00*
U.S. Cl. 427—45.1 **4 Claims**



1. A method of manufacturing a reaction vessel for crystal growing by providing a coating of silicon dioxide on the inside of a hollow member of quartz, characterized in that a mixture of argon, chlorine-free gaseous silane and a gaseous oxidant is

introduced into the hollow member heated at 250° to 350° C. and is converted by means of a microwave resonator into a porous coating of silicon dioxide at a pressure between 20 and 30 mbar, which coating is then sintered.

4,592,925

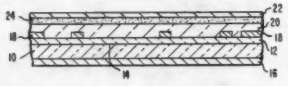
POLYIMIDE COMPOSITION AND METHOD FOR PROTECTING PHOTOREACTIVE CELLS

Preston S. Du Pont, Northridge, and Norman Bilow, Encino, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 451,137, Dec. 20, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 693,024

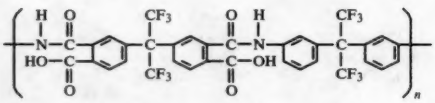
Int. Cl.⁴ H01L *21/312*

U.S. Cl. 427—74 **4 Claims**



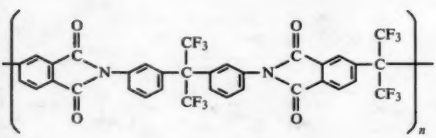
1. A method for applying a substantially colorless transparent protective heat resistant polymeric coating to a solar cell, said coating transmitting radiation and having high resistance to low energy protons, electron bombardment and resistance to ultraviolet light degradation, which comprises:

(a) applying a solution of polyamic acid to a solar radiation transmitting component of a solar cell, said polyamic acid having the recurring structural unit:



and

(b) heating said polyamic acid to convert same to the polyimide in the form of a film having the recurring structural unit:



and where n is a number ranging from 10 to about 2000.

4,592,926

PROCESSING APPARATUS AND METHOD

Richard H. Rubin, West Paterson, and Gary Hillman, Livingston, both of N.J., assignors to Machine Technology, Inc., Parsippany, N.J.

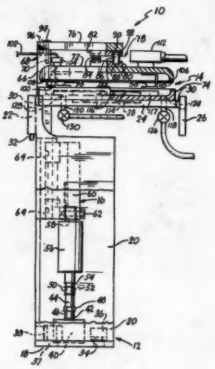
Filed May 21, 1984, Ser. No. 612,611

Int. Cl.⁴ B05D *5/12;* **C23C** *16/00*

U.S. Cl. 427—82 **27 Claims**

1. A processing apparatus, comprising a first casing section, including a processing station; a second casing section; moving means for moving said second casing section toward and away from said first casing section between a first position in which said second casing section is out of sealing engagement with said first casing section and a second position in which said second casing section is in sealing engagement with said first casing section and in which said first and second casing sections cooperate with each other to form a sealed interior chamber; and supporting means fixedly attached to said second casing section for supporting a workpiece from said second casing section such that the workpiece is carried by said second casing section as said second casing section moves between said first and second positions and such that the workpiece is disengaged from said supporting means and transferred from said second casing section to said processing station of said first casing section concurrently with the movement of said second casing section from said first position to said second position, whereby the transfer of the workpiece from said second casing section to said first casing section is made solely through the cooperation of said first casing section, including said processing station, and said second casing section, including said supporting means.

14. A method of processing a workpiece in a processing apparatus which includes a first casing section, a processing station associated with said first casing section, a second casing section, moving means for moving said second casing section toward and away from said first casing section between a first position in which said second casing section is out of sealing engagement with said first casing section, a second position in which said second casing section is out of sealing engagement with said first casing section, said second casing section being farther from said first casing section when it is in said second position as compared to said first position, and a third position in which said second casing section is in sealing engagement



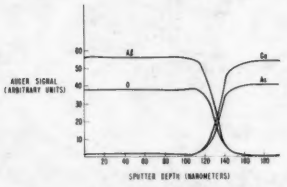
with said first casing section and in which said first and second casing sections cooperate with each other to form a sealed interior chamber, and supporting means fixedly attached to said second casing section for supporting a workpiece from said second casing section, said method comprising the steps of arranging said second casing section in said first position, positioning a workpiece a distance from said supporting means, moving said second casing section from said first position to said second position so that the workpiece is supported by said supporting means, disengaging the workpiece from said supporting means and transferring the work piece from said second casing section to said processing station of said first casing section concurrently with the movement of said second casing section from said second position to said third position, whereby the transfer of the workpiece from said second casing section to said first casing section is made solely through the cooperation of said first casing section, including said processing station, and said second casing section, including said supporting means, performing a processing operation on the workpiece while the workpiece is maintained at said processing station, and removing the workpiece from said processing station by moving said second casing section from said third position to said second position such that the workpiece is reengaged by said supporting means and transferred from said first casing section back to said second casing section.

4,592,927

GROWTH OF OXIDE THIN FILMS USING SOLID OXYGEN SOURCES

Richard A. Stall, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 422,673, Sep. 24, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,014
Int. Cl.[4] C23C *16/40*
U.S. Cl. 427—87 11 Claims



1. A method of fabricating a device including an oxide film R_mO_n, where R is at least one metal or at least one semiconductor, or combination thereof, and m and n are integers, comprising the steps of:

(a) mounting a substrate in a chamber,

(b) providing in the chamber a solid source of an oxygen compound, which is separate from the substrate and which does not contain R,

(c) providing an unoxidized source of R in the chamber, and

(d) heating the sources to evaporation, the evaporants reacting to form the oxide film R_mO_n on the substrate.

4,592,928

METHOD AND COMPOSITIONS FOR INHIBITING LEAKAGE CURRENT IN SILICON DIODES

Robert C. Antonen, San Ramon, Calif., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 9, 1985, Ser. No. 690,089
Int. Cl.[4] C08L *83/04*
U.S. Cl. 427—93 15 Claims

1. A method for increasing the resistance of silicon diodes to leakage currents, said method comprising

(I) applying to the junction area of said diodes a peroxide curable, elastomeric coating composition consisting essentially of

(a) at least one triorganosiloxy-endblocked polydiorganosiloxane exhibiting a viscosity of 0.1 to 500 Pa.s at 25° C. wherein the diorganosiloxane units present in (a) comprise dialkylsiloxane units and at least one member selected from the group consisting of phenylalkylsiloxane and diphenylsiloxane units, where phenyl radicals constitute from 0.1 to 10 mole percent of the silicon-bonded organic radicals of said diorganosiloxane units and where said alkyl radicals contain from 1 to 4 carbon atoms,

(b) from 10 to 70 percent, based on the total weight of said composition, of a nonconductive filler, and

(c) an organic peroxide in an amount sufficient to convert said composition to a cured elastomer at temperatures above 100° C., and

(II) heating said composition at a temperature above 100° C. for a time period sufficient to convert said composition to a cured elastomer.

4,592,929

PROCESS FOR METALLIZING PLASTICS

Timothy S. Tubergen, Northbridge, and Terrell A. Benjamin, Acton, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Feb. 1, 1984, Ser. No. 575,872
Int. Cl.[4] C23C *18/24*
U.S. Cl. 427—98 22 Claims

1. A process for the metallization of a plastic by electroless deposition including the step of treating the plastic with a liquid solution of an oxidant selected from the group of hexavalent chromium solutions and permanganate solutions prior to the metallization of the plastic, said process comprising contact of the plastic subsequent to treatment with the oxidant solution and prior to the steps of catalyzation and metallization with a solution containing a reducing agent in sufficient concentration and of sufficient strength to permit subsequent metal plating of the plastic part, a pH adjustor to render the reducing agent active and a surface active agent in sufficient concentration to reduce the surface tension of the solution to 50 dynes per square centimeter or less at the operating temperature of the solution.

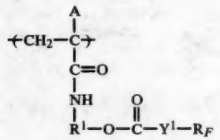
4,592,930

PERFLUOROCARBON BASED POLYMERIC COATINGS HAVING LOW CRITICAL SURFACE TENSIONS

Donald L. Schmidt, and Robert F. Harris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 609,264, May 11, 1984. This application Sep. 16, 1985, Ser. No. 777,264
Int. Cl.[4] B44D *1/20*
U.S. Cl. 427—133 8 Claims

1. A process for reducing the amount of sticking of material on the internal surfaces of a molding apparatus which comprises applying a solution of a polymer having pendant rearranged oxazoline and/or oxazine portions linked through an amide-ester linkage to a perfluorocarbon moiety having a perfluoroalkyl group and having a recurring unit of the formula:



wherein, A is hydrogen or methyl, R_F is a saturated perfluoroaliphatic moiety, Y^1 is a hydrocarbon moiety containing at least 2 carbon atoms, and R^1 is the remaining portion of a rearranged oxazoline or oxazine moiety.

4,592,931

METHOD FOR SOIL STABILIZATION AND FUGITIVE DUST CONTROL

Virgil H. Cargle, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 518,023, Jul. 28, 1983, abandoned. This application Aug. 10, 1984, Ser. No. 639,894
Int. Cl.[4] B05C *1/16*
U.S. Cl. 427—136 11 Claims

1. A method of treating soil comprising the steps of distributing a soil treating composition comprising an aqueous mixture of (a) homopolymers and copolymers of acrylic acid and salts thereof having a weight average molecular weight ($\overline{M}w$) ranging from 5,000 to about 30 million; (b) a monomeric polybasic carboxylic acid including salts thereof; and (c) a wetting agent, said homopolymers and copolymers of (a) having a weight ratio based on the weight of (b) ranging from 2 to 50, said

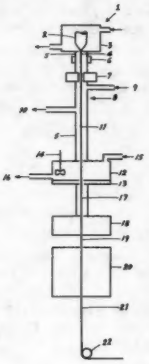
water being from 90 to 99.9 weight percent of the total composition into the surface layer of said soil and thereafter drying said surface layer whereby the geotechnical properties of said surface layer are enhanced.

4,592,932

HERMETIC COATING FOR AN OPTICAL FIBER

Dipak R. Biswas, and Satyabrata Raychaudhuri, both of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 26, 1984, Ser. No. 624,643
Int. Cl.[4] G02B *5/14*; B05D *1/18*
U.S. Cl. 427—163 **6 Claims**



1. A method of producing coated optical fibers comprising the steps of:

forming an optical fiber from a preform;

coating the fiber with a primary metallic coating;

providing a liquid medium which includes a metal containing composition;

immersing the fiber in the liquid medium;

maintaining the primary coating and the liquid medium at substantially the same electric potential;

adding to the liquid medium a reactant which is capable of inducing release of the metal from the composition at a predetermined temperature and deposition thereof onto the primary coating;

bringing the temperature of the liquid medium to the predetermined temperature; and

maintaining the temperature of the liquid medium at the predetermined temperature for a time sufficient for deposition to occur.

4,592,933

HIGH EFFICIENCY HOMOGENEOUS CHEMICAL VAPOR DEPOSITION

Bernard S. Meyerson, Yorktown Heights; Richard M. Plecenik, Wappingers Falls, and Bruce A. Scott, Pleasantville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,504
Int. Cl.[4] C23C *16/00, 16/30*
U.S. Cl. 427—255.1 **12 Claims**

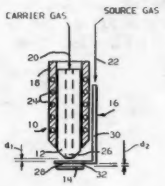
1. A homogeneous chemical vapor deposition (HCVD) method for depositing a film from the vapor phase onto a substrate which is at a temperature independently controllable with respect to the temperature of the vapor phase, comprising the steps of:

heating a first gas,

bringing said heated first gas to a location in the vicinity of a substrate onto which film deposition is to occur,

bringing a reactive source gas to said location, said source gas being at a temperature less than its pyrolysis temperature and containing constituents to be present in said deposited film,

intermixing said heated first gas and said source gas at said



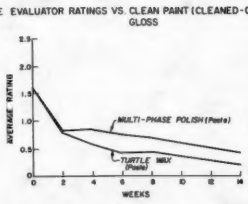
location to transfer heat from said first gas to said source gas, the amount of heat transferred being sufficient to cause decomposition of said source gas into intermediates which deposit onto said subtrate to produce said film.

4,592,934

METHOD OF PREPARING AND PACKAGING AUTOMOBILE WAX

Richard L. Wolstoncroft, Mt. Kisco, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 2, 1984, Ser. No. 667,896
Int. Cl.[4] B05D *3/12*; C09G *1/08*
U.S. Cl. 427—355 **69 Claims**



1. A multi-phase polish composition comprising: (a) an oil external emulsion phase comprising aminofunctional polysiloxane, finely-divided abrasive, petroleum distillate, water, emulsifier, stabilizer, preservative, but excluding dimethyl polysiloxane from said oil external emulsion phase; and, (b) a water external emulsion phase comprising dimethyl polysiloxane, wax, finely-divided abrasive, organic solvent, water, emulsifier, preservative, but excluding aminofunctional polysiloxane from said water external emulsion phase; said oil external emulsion phase and said water external emulsion phase being packaged in the same container in a manner such that said oil external emulsion phase and said water external emulsion phase are separate from each other until use; said multi-phase polish composition being characterized as providing long-lasting gloss and water beading properties when applied to a surface to be polished.

4,592,935

HEAT-RESISTANT GALVANIZED IRON ALLOY WIRE

Kenichi Sato; Satoshi Takano, and Kenji Miyazaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 564,876, Dec. 23, 1983, Pat. No. 4,556,609. This application Nov. 7, 1984, Ser. No. 669,187
Claims priority, application Japan, Dec. 24, 1982, 57-234317
Int. Cl.[4] C23C *1/02*
U.S. Cl. 428—659 **9 Claims**

1. A heat-resistant galvanized iron alloy wire, comprising:

an iron alloy wire core; and

a coating formed on the periphery of the iron alloy wire core, the coating comprising a Zn-Al alloy consisting essentially of 0.2 to 1.0 wt% of Al and the balance of Zn and including inevitably entrained impurities, provided that Pb is present in an amount of less than 0.05% and Sb is present in an amount of less than 0.02 wt%, wherein the core is comprised of 35 to 42 wt% Ni and a total of 0.2 to 10 wt% of an element selected from the group consisting of Cr, Mo, Si, Mn, C, Nb, Co, Al, Mg, and Ti, the remainder of the alloy being Fe.

4,592,936

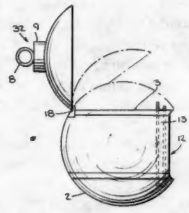
ORNAMENTAL ARTICLE WITH INTERNAL DISPLAY BRACKET

Daryl A. Ferguson, 888 Broomley Rd., Charlottesville, Va.

Continuation-in-part of Ser. No. 636,019, Jul. 30, 1984, abandoned. This application Oct. 31, 1984, Ser. No. 666,683

Int. Cl.[4] A47G *33/08*

U.S. Cl. 428—11 **21 Claims**



1. An ornamental display object for displaying an element or gift which comprises:

a hollow housing having an opening for providing access to an inner portion of said housing and an aperture for viewing said inner portion of said housing;

means disposed within said inner portion for positioning and removably holding the element to be displayed adjacent to said aperture; and

means coupled to the housing adjacent to said opening for covering said opening, said covering means being movable away from said opening for providing access to said inner portion of said housing through said opening so that the display element may be easily changed and said inner portion may receive and store small articles, the opening being sized to admit said element and said gift and the covering means conforming generally to the shape of said housing.

4,592,937

ARCUATE SIDE MOLDING

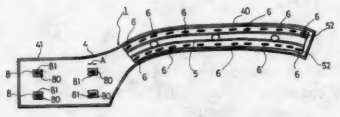
Takuji Nagata, Nishikasugai, and Isao Itou, Nagoya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 22, 1985, Ser. No. 768,152

Claims priority, application Japan, Aug. 28, 1984, 59-131012[U]

Int. Cl.[4] B60R *13/02*

U.S. Cl. 428—31 **2 Claims**



1. An arcuate side molding comprises:

a resin plate composed of:

a first molding portion which has a strip shape corresponding to an arcuate portion of an automobile body;

a second molding portion which has a larger width than that of said first molding portion,

a plurality of engaging projections being formed on the backside at least of said first molding portion; and

an intermediate member made of metal having an adhesive surface for at least partially adhering to said automobile body and slots which are formed in positions corresponding to said engaging projections of first molding portion, the longitudinal direction of which is appoximately parallel to that of said first molding portion,

wherein said engaging projections formed on said first molding portion of said resin plate are engaged in said slots of said intermediate member in a manner that said resin plate and said intermediate member are longitudinally slidable to each other.

4,592,938

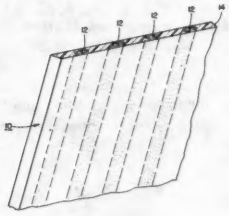
METHOD OF PRODUCING AN INTERNALLY REINFORCED THERMOPLASTIC FILM AND FILM AND ARTICLES PRODUCED THEREFROM

Gordon L. Benoit, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1985, Ser. No. 716,001

Int. Cl.[4] D04H *1/04*

U.S. Cl. 428—35 **20 Claims**



1. An internally reinforced aeolotropic thermoplastic film web constituted of coextruded thermoplastic resins having an increased tear resistance and tensile strength in at least the longitudinal or machine direction of said film web; comprising:

(a) a first thermoplastic resin forming a matrix for said thermoplastic film web; and

(b) a plurality of discrete parallel spaced continuous strips or stripes of a second thermoplastic resin embedded entirely within the confines of said first film web-forming thermoplastic matrix and extending in the machine direction of said film web to constitute said internally reinforced aeolotropic thermoplastic film having said increased tensile strength.

4,592,939

METHOD OF RENDERING UNIFORM COATING ON DISKS AND PRODUCT

Michael D. Temple; Thomas Mayer; Norman L. Boling, and James D. Rancourt, all of Santa Rosa, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 450,805, Dec. 17, 1982, abandoned. This application Dec. 4, 1984, Ser. No. 677,337

The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl.[4] B32B *3/02*

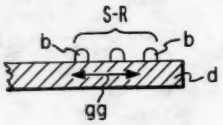
U.S. Cl. 428—64 **23 Claims**

1. A method of applying a coating of moderate-to-high viscosity to a disk substrate to yield very precise thickness uniformity, comprising the steps of:

formulating a coating mixture; and

applying this mixture in a prescribed stream to the disk

surface so as to form one or several arcuate bead segments, extending circularly or spirally about the disk surface;



the mixture being so formulated and so applied as to be capable of leveling and so rendering the desired coating.

20. The product of the method recited in claim 1.

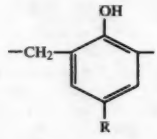
4,592,940

STAIN-RESISTANT NYLON CARPETS IMPREGNATED WITH CONDENSATION PRODUCT OF FORMALDEHYDE WITH MIXTURE OF DIPHENOLSULFONE AND PHENOLSULFONIC ACID

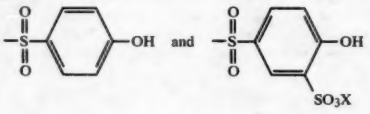
Randolph C. Blyth, Gulf Breeze, and Pompelio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 562,371, Dec. 16, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,302
Int. Cl.[4] B32B 3/02
U.S. Cl. 428—96 10 Claims

1. A process for imparting stain resistance to a carpet having a pile made from nylon yarn, comprising immersing said carpet in an aqueous solution of a polymeric condensation product consisting essentially of repeating units of the formula



where R is the same or different in each unit and is hydrogen or a radical selected from the group consisting of —SO_3X,



with the

proviso that at least 40% of the units contain an —SO_3X radical and at least 40% of the units contain the

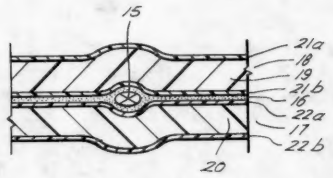
linkage, where X is H or a cation and the weight ratio of aqueous solution to nylon yarn, the pH and temperature of the solution and the amount of said condensation product in the solution are correlated to provide a carpet coated with a sufficient amount of the product to impart stain resistance to said carpet.

4,592,941

REINFORCED LAMINATE OF CO-EXTRUDED FILM

Keith Emmons, Houston, Tex., assignor to Reef Industries, Inc., Houston, Tex.

Filed Mar. 1, 1985, Ser. No. 707,429
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—113 12 Claims



1. A reinforced laminate film comprising

two thicknesses of co-extruded three ply film of a first film laminae and a second film laminae,

nonwoven reinforcing filament laid out in a diamond grid,

said nonwoven reinforcing filament grid is held between said first and said second film laminae by a pressure sensitive flexible adhesive layer which bonds said first and said second film laminae together,

said co-exteuded three-ply film has two ŏuter layers of linear low density polyethylene, and

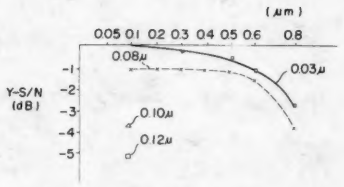
said co-extruded three-ply film has a middle layer that is by weight of said middle layer about 10% to about 25% linear low density polyethylene, about 14% to about 35% high density polyethylene, about 20% to about 50% polypropylene and about 5% to about 15% ethylene-propylene-diene rubber.

4,592,942

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu, Komoro; Toshiaki Ide; Hiroyuki Arioka, both of Saku, and Yuichi Kubota, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,575
Claims priority, application Japan, Sep. 20, 1983, 58-172208
Int. Cl.[4] G11B 5/72
U.S. Cl. 428—148 5 Claims



1. A magnetic recording medium comprising a non-magnetic substrate, a magnetic recording layer formed on one side of the substrate and a back coating layer on the other side of the substrate, characterized in that the back coating layer is a coating composed essentially of carbon black, a resin binder and a lubricant, the weight ratio of the carbon black to the binder being from 1:1 to 1:4, and the carbon black having a particle size of from 10 to less than 100 mμm.

4,592,943

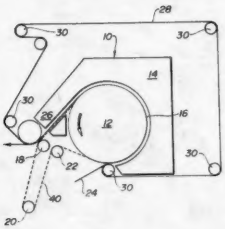
OPEN MESH BELT BONDED FABRIC

Annamaria C. Cancian, Appleton, Wis., and Charles J. Shimalla, Kendall Park, N.J., assignors to Chicopee, New Brunswick, N.J.

Continuation-in-part of Ser. No. 430,310, Sep. 30, 1982, abandoned. This application Apr. 10, 1984, Ser. No. 598,657

Int. Cl.[4] B32B 5/14

U.S. Cl. 428—171 6 Claims



1. A high loft, low density thermal bonded nonwoven fabric comprising at least 10 percent conjugate fibers, said fabric having a patterned surface comprising a pattern of puffed regions wherein the fibers are bent out of the plane of the fabric.

4,592,944

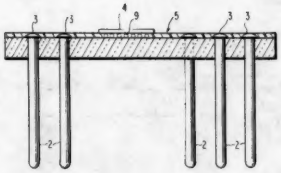
METHOD FOR PROVIDING A TOP SEAL COATING ON A SUBSTRATE CONTAINING AN ELECTRICALLY CONDUCTIVE PATTERN AND COATED ARTICLE

Roger J. Clark, Underhill, Vt.; James Economy, San Jose, Calif.; Mary A. Flandera, Endicott, N.Y.; John R. Susko, and Wheater, Robin A., both of Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 381,485, May 24, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 628,980

Int. Cl.[4] B05D 5/12

U.S. Cl. 428—195 37 Claims



1. An electronic circuit comprising: a substrate; electrically conductive pattern on said substrate in the form of at least one integrated circuit chip and a top seal coating for protecting the top side of circuit which contains the at least one integrated circuit chip from corrosion or electromigration or both and wherein said top seal coating is a continuous film formed from a soluble polymerizable oligomer wherein said oligomer is obtained from 1,3,5-triethynylbenzene, has a molecular weight of about 400 to about 2000, at least 60% of the acetylenic groups thereof are diacetylenic groups, each molecule of the oligomer contains at least two acetylenic groups, and the oligomer contains up to 20% by weight ethnyl content; and wherein said film is formed from a composition containing said oligomer and a plasticizer or toughening agent or both; wherein said plasticizer is selected from the group of diphenyldiacetylene, diphenylbutadiene, diphenylether, phenyltriethynyl silane, 4,4'diethynyl diphenyl ether, or mixtures thereof and said toughening agent is selected from the group of aromatic diphenylether, cyclized poly-(arylacetylene)polymer, acrylonitrile polymers, polyimides, polyquinoxalines, polyesters, polysilicones, or mixtures thereof; and wherein the plasticizer or toughening agent, or both, is employed in amounts of 10% to 75% by weight based upon the oligomer.

4,592,945

THERMOCOLOR RIBBON

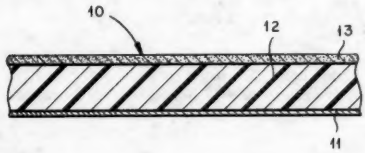
Norbert Mecke, Hanover; Heinrich Krauter, Neustadt, and Wieland Kuchenreuther, Isernhagen, all of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,818

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3328990

Int. Cl.[4] B41M 5/26

U.S. Cl. 428—195 8 Claims



1. A thermocolor ribbon for thermal printing processes comprising a plastic support foil, a fusible color layer at least partially coating a side of said plastic support foil, and an organic coating layer on opposite side of said plastic support foil, said organic coating layer being composed of a nonfiber-forming, pressure-stable coating material having substantially waxlike properties and improving color-transfer definition and preventing contaminants build up on a thermal printing head.

4,592,946

THERMAL INK TRANSFER RECORDING

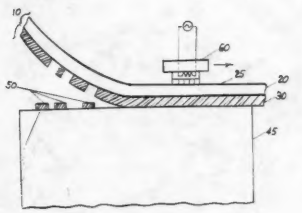
Ralph J. Shuman, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 525,188, Aug. 22, 1983, Pat. No. 4,510,206. This application Oct. 5, 1984, Ser. No. 657,903

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] B32B 5/16, 7/06

U.S. Cl. 428—200 20 Claims



1. An improved thermal ink transfer laminate of the type comprising:

a heat transferable laminate on a thermally conductive support member, said support member comprising material selected from the group consisting of paper and plastic film for transfer of images formed on said heat transferable laminate by contact of an electrically-activated heat generating printing element to a side of the support opposite said heat transferable laminate, said support member essentially not electrically conductive, said formed images transferred to a receiving article in contact with the heat

transferable laminate, wherein the improvement comprises a heat transferable laminate comprising:

a wax-based release layer in contact with the support member and a transfer ink coating over the release layer, the ink coating comprising a coloring agent and a resin binder, said coloring agent comprising a dyc dispersed in an unsaturated fatty acid having a carbon content between about C_{10} to C_{20}, said coloring agent effecting a sharp drop in the melt viscosity of the heat transferable laminate during transfer of said formed images to the receiving article.

4,592,947

LOW TEMPERATURE LAMINATABLE POLYURETHANE

Stanley M. Hunter, Simi Valley, and Steven L. Oujiri, Granada Hills, both of Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Jun. 4, 1984, Ser. No. 616,725

Int. Cl.[4] B32B *7/02, 27/36;* **C09J** *5/02*

U.S. Cl. 428—212 **26 Claims**

1. A light transmitting article capable of transmitting at least 8% of visible light comprising (i) a layer of cured polyurethane, sandwiched between (ii) a layer of a first material and (iii) a layer of a second material, where the first and second materials can be the same or different, and are selected from the group consisting of light transmitting glass, plastic, and ceramic; the polyurethane having been cured prior to being sandwiched between the first and second materials by a curing reaction which is carried out essentially in the absence of aromatic amines, the polyurethane having a Shore A hardness of at least about 60, and being capable of laminating to the other two layers at a lamination temperature below 150° F. and a pressure below 200 psig so that the article does not delaminate at romm temperature at 2 pli.

8. The laminated article of claim **1** where the coefficient of thermal expansion of the first material is at least about five times the coefficient of thermal expansion of the second material within the temperature range of from 100° F. to 200° F.

4,592,948

MAGNETIC RECORDING MEDIUM

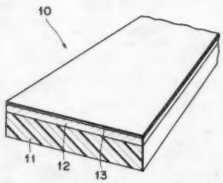
Osamu Kohmoto, Ichikawa; Yasufumi Takasugi; Hiroshi Sugihara, both of Saku, and Masaharu Nishimatsu, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,512

Claims priority, application Japan, Dec. 25, 1982, 57-234817

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—216 **14 Claims**



1. A magnetic recording medium comprising a substrate, a continuous thin magnetic layer on the substrate, and a topcoat formed over the magnetic layer, characterized in that the topcoat consists of a compound having the formula:

$$RNH_2$$

where R is an alkyl radical having 10 to 22 carbon atoms deposited by evaporation or sputtering.

4,592,949

VINYLIDENE FLUORIDE RESIN SPLIT YARN, PROCESS FOR PRODUCTION THEREOF AND FILTER COMPRISING THE SAME

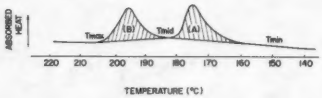
Toshiya Mizuno; Yoshikichi Teramoto, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1985, Ser. No. 732,432

Claims priority, application Japan, May 7, 1984, 59-89498; May 7, 1984, 59-89499

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—224 **10 Claims**



1. A split yarn of a vinylidene fluoride resin characterized by:

(a) having a crystal melting point of 182° C. or higher as measured at a temperature elevation speed of 10° C./minute in nitrogen atmosphere by a differential scanning calorimeter, and

(b) comprising crystals giving an average crystal width of 200 Å or larger.

4,592,950

COMPOSITE ASSEMBLY FORMING THERMAL PROTECTION OR DISSIPATION SCREEN

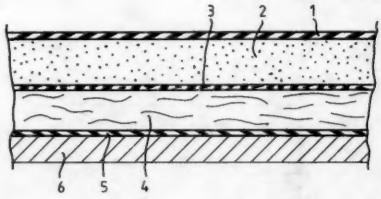
Roger A. L. Le Touche, Ecquevilly, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Jun. 26, 1984, Ser. No. 624,751

Claims priority, application France, Jun. 27, 1983, 83 10560

Int. Cl.[4] B64C *1/38, 1/40;* **B64G** *1/00;* **B65D** *90/04*

U.S. Cl. 428—284 **10 Claims**



1. A composite assembly forming a thermal protection or dissipation screen with a face constituting a hot face when a thermal aggression occurs and a cold face in contact with the item to be protected, said composite assembly comprising, extending from said hot face towards said cold face, at least two adjacent vaporizer-overheater elements of a supple refractory material, the first of said adjacent elements comprising a first substance capable of releasing a non-inflammable gas or vapor at a first temperature T_1 and the second of said adjacent elements comprising a second substance capable of releasing a non-inflammable gas or vapor at a second temperature T_2 lower than T_1, said at least two adjacent elements being separated by a supple or rigid layer which is gas or vapor-tight up to said temperature T_1 and becoming porous as soon as said temperature is exceeded, each element, due to the presence of said substance included therein, evolving from the vaporizing function to the overheating function depending on the development of the thermal aggression.

4,592,951

INK JET RECORDING SHEET

Michael S. Viola, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 18, 1984, Ser. No. 631,863
Int. Cl.[4] B32B *5/16, 27/36;* B05D *1/36, 5/06*
U.S. Cl. 428—323 24 Claims

1. A transparent ink jet recording sheet comprising a transparent support carrying a layer of cross-linked polyvinyl alcohol.

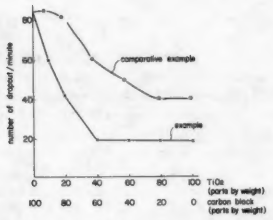
5. The product of claim 1 wherein said layer includes up to 0.2% by weight particulate material less than 30 micrometers in size.

4,592,952

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi, Odawara; Toshimitu Okutu, and Masaaki Fujiyama, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 26, 1983, Ser. No. 536,008
Claims priority, application Japan, Sep. 27, 1982, 57-166662
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 7 Claims



1. A magnetic recording medium comprising a non-magnetic support, a magnetic layer on a surface of the non-magnetic support, and a backing layer on a reverse surface of the non-magnetic support, said backing layer being composed of a powder and a binder and having a thickness of not more than 2 microns, wherein said powder comprises TiO_2 powder having an average particle size ranging from 0.01 to 0.8 microns and carbon black powder in the weight ratio of 4:6 to 6:4.

4,592,953

POLYESTER FILM PRIMED WITH CROSSLINKED VINYL ACETATE POLYMERS

Grover L. Farrar, Greenville, and E. C. Culbertson, Greer, both of S.C., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Dec. 12, 1983, Ser. No. 560,647
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—332 21 Claims

1. An oriented self-supporting polyester film having a continuous cross-linked primer coating on one or both sides thereof, said polyester film prepared by melt extruding a substantially amorphous polyester film and thereafter orienting the film by stretching in one or two directions and heat setting the film, said primer coating being applied to said film from an aqueous medium prior to stretching in one direction or subsequent to stretching in one direction but prior to stretching in a mutually perpendicular direction, said primer coating consisting essentially of a substantially halogen-free copolymer of at least about 50 percent by weight of polymerized vinyl acetate, from about 1 to about 15% by weight of a copolymerized N-methylol functional group-containing comonomer which in the copolymerized state is capable of inter-molecular crosslinking by the application of heat, and from about 0 to 49% by weight of one or more halogen-free monoethylenically unsaturate copolymerized monomers.

7. The film of claim 1 wherein said primer coating has a dry thickness within the range of about 10^{-7} to 10^{-5} inch.

4,592,954

INK JET TRANSPARENCIES WITH COATING COMPOSITIONS THEREOVER

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 25, 1985, Ser. No. 695,026
Int. Cl.[4] B41M *5/00*
U.S. Cl. 428—335 7 Claims

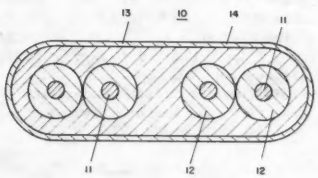
1. A transparency for ink jet printing comprised of a supporting substrate and thereover a coating consisting essentially of 40 to 60 percent by weight of carboxymethyl cellulose, and 60 to 40 percent by weight of polyethylene oxides.

4,592,955

INSULATING COVERING FOR STRAND MATERIAL

Jae H. Choi, Warren Township, Marion County, Ind.; William M. Kanotz, Baldwin, and William C. Vesperman, Bel Air, both of Md., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Murray Hill, both of, N.J.

Filed Oct. 31, 1984, Ser. No. 666,640
Int. Cl.[4] B32B *9/00, 27/00;* G02B *6/44*
U.S. Cl. 428—389 10 Claims



7. A strand material having an insulating covering thereover, said covering comprising an extruded blend of from >10 to <20 weight parts of a styrene-ethylenebutylene-styrene copolymer wherein the length of the styrene chains exceeds the length of the ethylenebutylene chain, >10 to <20 weight parts of a low melt index polypropylene and >50 to <80 weight parts of a high melt index polypropylene.

4,592,956

TREATED GLASS FIBERS AND AQUEOUS DISPERSION AND NONWOVEN MAT OF THE GLASS FIBERS

Peter C. Gaa, Pittsburgh, Pa.; Jerry C. Hedden, Shelby, N.C., and Narasimhan Raghupathi, Murrysville, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 5, 1984, Ser. No. 658,009
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—391 19 Claims

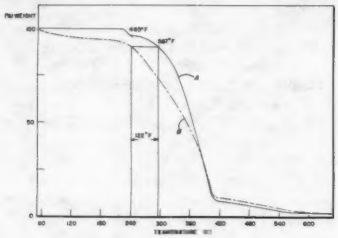
1. Glass fibers coated with an aqueous chemical treating composition, comprising:

(a) one or more cationic surfactants having one or more primary, secondary, or tertiary amine moieties in an amount of about 0.01 to about 10 weight percent of said aqueous chemical treating composition,

(b) one or more water soluble, poly(oxyalkylene-oxyethylene) copolymers having a ratio of the total amount of ethylene oxide to the total amount of hydrophobic alkylene oxide in the range of around 99/1 to around 78/22 and a molecular weight of around at least 15,000 in an effective amount to provide sufficient protection to the glass fibers,

(c) one or more polar functional coupling agents in an

amount of about 0.01 to about 2 weight percent of said aqueous chemical treating composition, and



(d) water in an amount to give, a solids content that is effective for applying said composition to glass fibers.

4,592,957

MICROCAPSULES HAVING WALLS OF POLYADDITION PRODUCTS OF WATER-INSOLUBLE POLYAMINES WITH WATER-SOLUBLE POLYISOCYANATE ADDUCTS

Manfred Dahm; Norbert Weimann; Ulrich Nehen, all of Leverkusen; Hanns P. Müller, Odenthal-Blecher; Gert Jabs; Albert Awater, both of Odenthal, and James M. Barnes, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 506,451, Jun. 21, 1983, Pat. No. 4,517,141. This application Jan. 14, 1985, Ser. No. 691,402

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224454; Jun. 30, 1982, 3224456

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] B01J *13/02*

U.S. Cl. 428—402.21 **6 Claims**

1. A microcapsule comprising a capsule wall enclosing hydrophobic core material produced by the process comprising emulsifying in water or in an aqueous protective colloid solution a mixture of hydrophobic core material and a water-insoluble polyamine containing at least two primary amino groups, adding a water-soluble polyisocyante bisulphite adduct in the form of a powder or and aqueous solution and allowing the mixture to react to completion at a temperature of from 1° to 140° C.

4,592,958

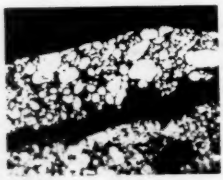
COATED PART, COATING THEREFOR AND METHOD OF FORMING SAME

Mark F. Mosser, Sellersville, and Alfred E. Simmons, Jr., Harleysville, both of Pa., assignors to Sermatech, Limerick, Pa.

Filed Jan. 18, 1983, Ser. No. 458,975

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—432 **19 Claims**



Siliconized layer at 1000X.

1. A coating on an intrinsic rectifier metal surface or on an induced rectifier metal surface or on a non-metal surface which coating has improved corrosion, temperature and abrasion resistance which coating comprises two layers, a first cured layer which comprises phosphate ions and ions selected from the group consisting of chromate and molybate ions and a rectificable metal bonded therein and a second layer bonded on said first layer by silicodizing at a low voltage, which second layer is a porous oxide layer.

4,592,959

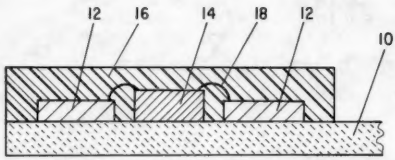
SILICONE ENCAPSULATED DEVICES

Ching-Ping Wong, Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Nov. 19, 1984, Ser. No. 673,011

Int. Cl.[4] B32B *9/06*

U.S. Cl. 428—450 **10 Claims**



1. An article of manufacture comprises an electronic device having gold or tantalum conductive areas on a surface thereof, a silicone resin encapsulant thereover which is adherent to said gold or tantalum surfaces and wherein said encapsulant is derived from curing a heat curable silicone resin formulation comprising a silicone, a primary amine additive and an acid which is volatile at the curing temperature, said acid being present in a molar quantity approximately equal to or slightly greater than the number of moles of primary amine present in the formulation.

4,592,960

PRODUCTION OF POLYOLEFIN COPOLYMER

Hiroshi Inoue; Tadashi Sezume, both of Saitama, and Kazuo Sei, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 490,810, May 2, 1983, abandoned. This application Apr. 17, 1985, Ser. No. 723,998

Claims priority, application Japan, May 17, 1982, 57-81473

Int. Cl.[4] B32B *27/00, 27/08, 15/08*

U.S. Cl. 428—461 **22 Claims**

1. A composite comprising

(a) a substrate of a metal or a resin selected from one or more of vinyl chloride resin, acrylic resin, polyester resin, styrene resin, and ABS resin; and

(b) a modified polyolefin of ethylene or propylene adhered to said substrate wherein the polyolefin has grafted thereto an unsaturated carboxylic acid or anhydride thereof and the grafted polyolefin is reacted with a polar polymer or copolymer which is the reaction product of a vinyl compound and amino containing compound, said reaction product having reactive amino groups and a weight average molecular weight of between about 20,000 and 1,000,000.

13. A laminate comprising

(a) a first layer of a metal or a resin selected from one or more of vinyl chloride resin, acrylic resin, styrene resin;

(b) a second layer of a polyolefin resin selected from ethylene or propylene polymers and copolymers; and

(c) an adhesive layer adhesively joining said first and second layers and comprising a modified polyolefin of ethylene or propylene having grafted thereon from 1 to 10 unsaturated carboxylic acid or anhydride thereof in the molecule including terminals thereof and having a weight average molecular weight of 10,000 to 500,000, the grafted poly-

olefin being reacted with a polar polymer or copolymer in a weight ratio of 20 to 200 parts by weight of the polar polymer or copolymer per 100 parts by weight of the grafted polyolefin, said polar polymer or copolymer being the vinyl polymerization product of a vinyl compound and an amino containing compound and having from 1 to 10 reactive amino groups in the molecule or terminals thereof and weight average molecular weight of between 20,000 and 1,000,000.

4,592,961

PARTICLE FILLED FLEXIBLE COATING COMPOSITION OF AROMATIC POLYESTER AND VINYLIDENE CHLORIDE COPOLYMER

John E. Ehrreich, Acton, Mass., assignor to Ercon, Inc., Waltham, Mass.

Filed Oct. 9, 1984, Ser. No. 658,575
Int. Cl.[4] B32B *27/06;* B05D *3/02;* B22F *3/00*
U.S. Cl. 428—480 23 Claims

1. A solid composition comprising a substantial volume of particles held in particle-to-particle contact within an organic binder wherein said binder consists of at least 80% of a blend of (a) thermoplastic aromatic polyester resin and (b) a vinylidene chloride copolymer.

20. In an improved coated product comprising a biaxially-oriented polyester film substrate and a thin particle-loaded organic resin coating thereover, the improvement wherein said coating is formed of the coating composition defined by claim 1.

4,592,962

PROCESS FOR ACETYLATING A WOOD MATERIAL

Eiichi Aoki, and Hideyuki Kobayashi, both of Okayama, Japan, assignors to Daiken Trade & Industry Co., Ltd., Toyamo, Japan

Filed May 11, 1984, Ser. No. 609,149
Claims priority, application Japan, May 12, 1983, 58-83938
Int. Cl.[4] B05D *1/18, 3/02;* D06M *13/20*
U.S. Cl. 428—541 12 Claims

1. A process for acetylating a wood material which comprises:

(a) impregnating the wood material with an aqueous solution of an alkali metal acetate until the alkali metal acetate penetrating into the wood material comprises 2 to 20% by weight of the dry weight of the wood material,

(b) drying the wood material containing the alkali metal acetate solution,

(c) impregnating the dried wood material with acetic anhydride for a period of time effective to cause the acetylation of the wood material, said acetic anhydride being at a temperature of 100° C. to 150° C.

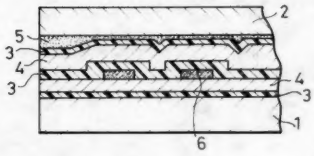
8. An acetylated wood material obtained by any one of the processes disclosed in any one of claims 1 to 7.

4,592,963

THIN-FILM MAGNETIC HEAD AND COMPOSITE MATERIAL SUBSTRATE THEREFOR

Koichi Mukasa; Takashi Hatanai, both of Nigata; Keishi Nakashima, Yunotani, and Kazumasa Onishi, Nigata, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 513,230, Jul. 13, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 661,067
Int. Cl.[4] G11B *5/28*
U.S. Cl. 428—544 22 Claims



1. A composite material for use in the preparation of a substrate for thin film magnetic heads consisting essentially of about 50 to 95% by volume carbonaceous or graphitic carbon or mixtures of these together with about 5 to 50% of a binder.

4,592,964

WEAR-RESISTANT COATING

Ulrich Büran, Burscheid; Manfred Fischer, Leichlingen, and Hans-Jochem Neuhäuser, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,299
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421569
Int. Cl.[4] C22C *29/00*
U.S. Cl. 428—610 20 Claims

1. In a sprayed-on wear-resistant coating carried on a substrate constituted by a machine part surface, the coating having an inner face oriented towards the substrate and an outer face oriented away from the substrate; the improvement wherein the coating consists of a material whose structure continuously varies from said inner face towards said outer face.

4,592,965

SURFACE TREATMENT OF HIGH-NICKEL/IRON ALLOY STEEL PLATE FOR LNG OR LPG TANKS

Takenori Deguchi; Kazuko Uchida; Takao Ikita, all of Chiba; Shigeaki Maruhaski, Yamaguchi; Kazuo Hoshino, Yamaguchi, and Keiji Oosaki, Yamaguchi, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 392,131, Jun. 25, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,611
Claims priority, application Japan, Jun. 26, 1981, 56-98216
Int. Cl.[4] B23P *3/00*
U.S. Cl. 428—621 2 Claims

1. A corrosion resistant plate for LNG or LPG tanks which consists essentially of a nickel/iron alloy steel plate having a 35–37% nickel content as provided by ASTM SA-658; a first coating comprising metallic nickel in an amount of about 1 to 10 g/m^2 calculated as nickel metal; and a second coating comprising a chromate film in an amount of about 5 to 100 mg/m^2 calculated as chromium metal, said chromate being applied by a method other than electrochromating.

4,592,966

METHODS OF MANUFACTURING INORGANIC RESIN BOUND ARTICLES AND PRODUCT

William L. Prior, Newark, and William C. Sargeant, Bolivar, both of Ohio, assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 656,686, Oct. 1, 1984, which is a continuation-in-part of Ser. No. 415,314, Sep. 7, 1982, Pat. No. 4,504,555. This application Jan. 8, 1985, Ser. No. 689,707

Int. Cl.[4] B05D *1/36, 7/00;* B32B *9/00, 19/00*

U.S. Cl. 428—689 48 Claims

33. An article of manufacture formed by impregnating a liquid-penetrable substrate with a component B to absorb component B into said substrate to form a reactive substrate, and then contacting said reactive substrate with a component A to cause a reaction within the substrate wherein component A includes water; an aluminum phosphate, or a magnesium phosphate or a mixture thereof; and wherein component B includes a phosphate-reactive material selected from the group consisting of a source of magnesium oxide, wollastonite and mixtures thereof; and an essentially nonreactive phosphate dispersing agent.

4,592,967

GAS SENSOR OF MIXED OXIDES

Koji Komatsu, Toyonaka, and Sai Sakai, Osaka, both of Japan, assignors to New Cosmos Electric Co., Ltd, Japan

Filed Feb. 24, 1984, Ser. No. 575,629

Claims priority, application Japan, Feb. 3, 1983, 58-15464; Jul. 23, 1983, 58-113726[U]

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—697 5 Claims

1. A gas sensor adapted to detect hydrogen, methane, ethyl alcohol and the like and maintained at about 300° to 450° C. in operation, the gas sensor comprising:

a sintered piece composed of tin oxide (SnO_2), at least one of lanthanide oxides in 0.01–20 mol % of the tin oxide, and at least one of IVa group metal oxides in 0.01–20 mol % of the tin oxide.

4,592,968

COKE AND GRAPHITE FILLED SEPARATOR PLATE FOR ELECTROCHEMICAL CELLS

William A. Taylor, Glastonbury, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Jul. 18, 1985, Ser. No. 756,473

Int. Cl.[4] H01M *2/16*

U.S. Cl. 429—34 12 Claims

1. An electrochemical cell separator plate comprising a molded, carbonized and graphitized product formed from a carbonizable and graphitizable molding composition wherein the improvement utilizing a carbonizable and graphitizable molding comprises composition comprising:

about 40 weight % to about 60 weight % of carbonizable resin; and

about 60 weight % to about 40 weight % of a coke-graphite mixture;

said coke particles having size less than 149 microns and said graphite particles having size less than 120 microns.

the coke-graphite mixture comprising about 30 weight % to about 90 weight % of coke particles and about 70 weight % to about 10 weight % of graphite particles.

4,592,969

ELECTROCHEMICAL CELL

Johan Coetzer, and Margaretha Nolte, both of Pretoria, South Africa, assignors to Lilliwyte Societe Anonyme, Luxembourg

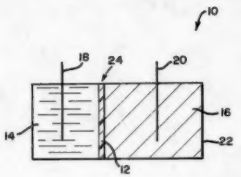
Filed May 24, 1985, Ser. No. 737,442

Claims priority, application South Africa, May 28, 1984, 84/4040

Int. Cl.[4] H01M *10/39*

U.S. Cl. 429—50 15 Claims

1. A rechargeable high temperature electrochemical cell which comprises a sodium anode which is molten at the operating temperature of the cell, a molten halide salt liquid electrolyte which is also molten at the operating temperature of the cell, a compatible cathode which is in contact with the liquid electrolyte and, between the anode and the liquid electrolyte and isolating the anode from the liquid electrolyte, a beta-alumina solid electrolyte, the molten salt electrolyte comprising sodium cations as the only alkali metal cations therein, aluminium cations, chloride anions, and fluoride anions, the liquid electrolyte with the cell in its fully charged state being capable of representation as a mixture containing $AlCl_3$, NaCl and NaF in which the molar proportion of $AlCl_3$ is no greater than the molar proportion of sodium halide.



4,592,970

ELECTROCHEMICAL CELL HAVING A SAFETY VENT CLOSURE

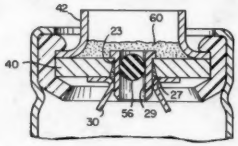
Ronald L. Zupancic, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 27, 1984, Ser. No. 654,949

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] H01M *2/12*

U.S. Cl. 429—82 10 Claims



1. In an electrochemical cell comprising active components of the cell assembled within a housing, said housing having at least one orifice defined by a wall in said housing, a liner that is corrosion-resistant to the cell's active components disposed adjacent the wall defining the orifice, a member force-fitted within said liner to provide a normally fluid tight-seal for said vent orifice, and wherein at least one of said member and said liner is resiliently deformable such that said member is adapted to be at least partially expelled from the vent orifice upon a predetermined internal gas pressure within the cell; the improvement wherein a first sealant is disposed at the interface of the wall defining the orifice and the corrosion resistant liner.

4,592,971

METAL HALOGEN ELECTROCHEMICAL CELL

Fraser M. Walsh, Arlington, Mass., assignor to Tracer Technologies, Inc., Newton, Mass.

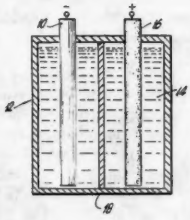
Filed Dec. 13, 1978, Ser. No. 969,228

Int. Cl.[4] H01M *4/36*

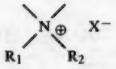
U.S. Cl. 429—105 4 Claims

1. In an electrochemical cell having a metal anode selected from the group consisting of zinc and cadmium; a bromine cathode; and, an aqueous electrolyte containing a metal bro-

mide, the metal bromide having the same metal as the metal of the anode, the improvement comprising: a bromine complexing agent in said aqueous metal bromide electrolyte consisting solely of a tetraorgano substituted ammonium salt, which salt is



soluble in water and forms a substantially water immiscible liquid bromine complex at temperatures in the range of about 10° C. to about 60° C. and wherein the tetraorgano substituted ammonium salt is selected from asymmetric quaternary ammonium compounds having the formula:



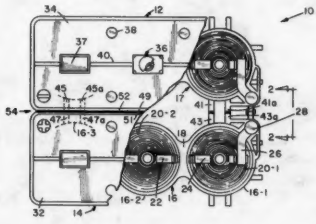
wherein the dangling valences of nitrogen indicates that the nitrogen is an endocyclic nitrogen atom connected to carbon atoms, thereby forming a saturated seven member ring structure and wherein X- is a halide selected from chloride and bromide, and R_1 and R_2 are selected from alkyl groups and haloalkyl groups of from 1 to 8 carbon atoms.

4,592,972

VIBRATION-RESISTANT BATTERY ASSEMBLY

Tristan Juergens, Conifer, and Hugo Tesch, Castle Rock, both of Colo., assignors to Gates Energy Products, Inc., Denver, Colo.

Filed Jul. 22, 1983, Ser. No. 516,418
Int. Cl.⁴ H01M *2/24*
U.S. Cl. 429—160 **24 Claims**



1. An integral vibration-resistant battery assembly comprised of a plurality of interchangeable modular cell or battery housings electrically interconnected to form a battery of increased voltage and/or capacity, characterized in that: the housings are provided with corresponding rib members formed of thermoplastic material, which protrude from the housings, and rib members of adjacent interchangeable housings are in abutting alignment with one another and are self-adhered together by heat fusion to form a substantially rigid assembly, the adjacent housings being spaced apart next to the rib members by an air gap in communication with the exterior of the assembly.

4,592,973

SUPPORTED LIQUID MEMBRANE ELECTROCHEMICAL SEPARATORS

J. Paul Pemsler, Lexington, and Michael D. Dempsey, Revere, both of Mass., assignors to Castle Technology Corp., Woburn, Mass.

Continuation of Ser. No. 539,125, Oct. 5, 1983, abandoned. This application May 3, 1985, Ser. No. 730,251
Int. Cl.⁴ H01M *6/04*
U.S. Cl. 429—206 **11 Claims**

1. A separator for use in electrochemical cells, comprising: a hydrophobic microporous membrane; and

a liquid ionic transport agent comprising an organic agent dissolved in an organic solvent supported by a porous matrix of the membrane that selectively transports specific cation or anion species through the membrane while rejecting others, wherein said liquid ionic transport agent is insoluble in the electrochemical electrolyte solution.

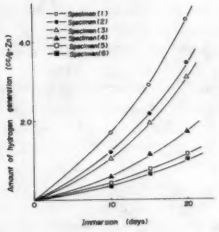
11. In an alkaline battery comprising at least one pair of a positive electrode and a negative electrode the improvement comprising a hydrophobic microporous membrane which supports within its porous matrix a liquid ionic transport agent interposed between the negative and the positive electrode, said agent which is substantially insoluble in the electrochemical electrolyte solution and consisting essentially of an organic ion transport agent in a polar organic solvent therefore, such that the electrolyte insoluble agent selectively transports specific cation and anion species through the microporous membrane.

4,592,974

ACTIVE MATERIAL FOR NEGATIVE POLES OF ALKALINE DRY CELLS, AND METHOD FOR MAKING SAID MATERIAL

Ryuzo Takeda; Shigeru Ooyama, and Yukio Ishibashi, all of Akita, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,369
Claims priority, application Japan, Aug. 15, 1984, 59-170228
Int. Cl.⁴ H01M *4/42*
U.S. Cl. 429—229 **7 Claims**



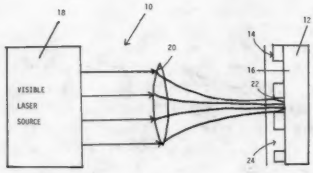
1. Active materials for negative poles in alkaline dry cells comprising:

(a) about 99.7–93% zinc powder alloyed with about 0.3–7% of a liquid alloy comprising at least three elements selected from the group consisting of; 40–50% weight bismuth, 18–25% weight lead, 18–25% weight indium, less than 6% weight cadmium and less than 80% weight gallium.

4,592,975
METHOD FOR REPAIRING A PHOTOMASK BY LASER-INDUCED POLYMER DEGRADATION

Peter L. Young, South Barrington; Modest M. Oprysko, Roselle, and Mark W. Beranek, Arlington Heights, all of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 20, 1984, Ser. No. 622,367
Int. Cl.[4] G03F 9/00; B23K 9/00
U.S. Cl. 430—5 **27 Claims**



1. A method for repairing clear defects on a photomask comprising:

coating the photomask with a novolak-based polymer;

directing a laser beam onto a portion of the novolak-based polymer coating for localized heating thereof to a temperature above 500 degrees Celsius to degrade the novolak-based polymer without damaging the photomask wherein the degraded novolak-based polymer has an optical density of at least 2.5; and

removing that portion of the novolak-based polymer coating not degraded by the laser.

4,592,976
IDENTIFICATION CARD

Edwin N. Whitehead, Alexandria, Va., assignor to N. Peter Whitehead, Charlottesville, Va.

Filed Dec. 7, 1984, Ser. No. 679,280
Int. Cl.[4] B42D 15/00; G03C 1/76; C09F 3/02
U.S. Cl. 430—10 **17 Claims**

1. An identification card, comprising

(a) a laminable, photographic image support selected from the group consisting of a spun-bonded polyester and a tightly-woven fabric including an upper layer impregnated with a light-sensitive photographic emulsion for reproduction of a photographic image thereon, and a lower layer impregnated with a hot melt thermoplastic adhesive having bonding characteristics of polyvinyl chloride,

(b) a laminable, identification indicia bearing layer,

(c) a durable resilient backing adapted to have said support and said indicia bearing layer laminated thereto where upon application of sufficient energy irreversible bonding of said support and indicia bearing layer to said backing is effected.

16. An indentification card, comprising

(a) a laminable photographic support, said support being selected from the group consisting of spun bonded polyester and tightly woven fabric, said support permitting migration of a photographic emulsion therein,

(b) a durable resilient backing,

(c) a layer of hot melt adhesive disposed between said support and said backing, said adhesive being capable of impregnating at least a portion of said support and uniting said backing and support at lamination conditions,

(d) a laminable, identification indicia bearing layer adapted to laminate to said backing at lamination conditions,

(e) whereupon positioning said support and layer on said backing and establishing lamination conditions renders said adhesive flowable to irreversibly bond said support to said backing and said layer laminates to said backing.

4,592,977
LITHOGRAPHIC PRINTING PLATE

Tsutomu Naganuma; Sigeru Hirayama; Hiroji Kumagai; Manabu Sawada; Tsuneo Tanaka, and Isao Kumano, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd. and Toyo Ink Mfg. Co., Ltd., both of, Japan

Filed Jun. 19, 1984, Ser. No. 622,226
Int. Cl.[4] G03G 5/06, 5/087
U.S. Cl. 430—18 **4 Claims**

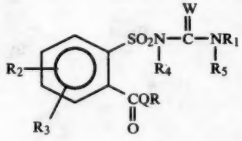
1. A lithographic printing plate comprising an electrophotographic plate having a photoconductive layer on a conductive substrate, said photconductive layer being prepared by dispersing a mixture containing from about 20–45% by weight of a phthalocyanine pigment to the amount of photoconductive zinc oxide and zinc sulfide into a binder resin, said photoconductive zinc oxide being 20–60% by weight of a mixture of said phthalocyanine pigment, zinc oxide, zinc sulfide, and binder resin, said electrophotographic plate being charged, an electrostatic latent image formed when said charged electrophotographic plate is exposed to an image, the exposed electrophotographic plate being developed by the use of an ink receptive toner for developing said exposed electrophotographic plate, and the developed electrophotographic plate being fixed thereby to fabricate said lithographic printing plate.

4,592,978
AGRICULTURAL SULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506, which is a continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Dec. 22, 1982, Ser. No. 452,106
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.
Int. Cl.[4] C07D 239/28, 239/30
U.S. Cl. 544—321 **22 Claims**

1. A compound of the formula



wherein

Q is O;

R is C_1–C_{12} alkyl; C_3–C_{10} alkenyl; C_3–C_{10} alkynyl; C_2–C_6 alkyl substituted with 1–4 substituents selected from (a) 0–3 atoms of F, Cl or Br, (b) 0–2 OCH_3 groups or (c) 0–1 cyano groups;

R is also CH_2CN; $CH(R_7')CO_2CH_3$; $CH(R_7')CO_2C_2H_5$; C_3–C_6 alkenyl substituted with 1–3 atoms of F, Cl or Br;

R is also C_3–C_6 alkynyl substituted with one of F, Cl or Br;

R is also C_5–C_8 cycloalkyl; C_5–C_8 cycloalkenyl; C_5–C_6 cycloalkyl substituted with (a) OCH_3, (b) C_2–C_4 alkyl, (c) F, Cl or Br or (d) 1–4 CH_3 groups;

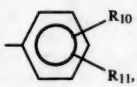
R is also C_4–C_{10} cycloalkylalkyl; C_{4-C8} cycloalkylalkyl substituted with 1–2 CH_3 groups;

R is also C_7–C_{10} bicycloalkyl; C_7–C_{10} bicycloalkenyl; C_{10} tricycloalkyl; C_{10} tricycloalkenyl;

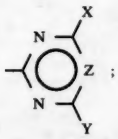
R_7' is H or CH_3;

R is also H; M; $CH_2CH_2OR_7$; $CH_2CH_2CH_2OR_7$; $CH(CH_3)CH_2OR_7$; CH_2OR_8'; $(CH_2CH_2O)_{n'}R_8$; $(CH(CH_3)CH_2O)_{n'}R_8$; $CH_2CH_2S(O)_{0,2}R_{12}$; $CH_2CH_2CH_2S(O)_{0,2}R_{12}$; where

R_7 is CH_2CH_3, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl or CH_2CCl_3;
R_8' is CH_3, CH_2CH_3, $CH(CH_3)_2$, CH_2CH_2Cl, CH_2CCl_3, phenyl,



$CH_2CH_2OCH_3$ or $CH_2CH_2OCH_2CH_3$;
R_8 is CH_3, CH_2CH_3, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl or CH_2CCl_3;
n' is 2 or 3;
R_{10} and R_{11} are independently H, C_1, C_3 alkyl, Cl, Br, OCH_3 or OC_2H_5;
R_{12} is CH_3, CH_2CH_3, $CH(CH_3)_2$ or phenyl;
R_1 is



R_2 is H, Cl, Br, F, C_1–C_3 alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3, $N(CH_3)_2$, NH_2 or CN;
R_3 is H, Cl, Br, F or CH_3;
R_4 is H or CH_3;
R_5 is H, CH_3 or OCH_3;
M is an alkali metal;
W is O or S;
X is H, Cl, CH_3, OCH_3, OCH_2CH_3 or $OCH_2CH_2OCH_3$;
Y is H, F; Cl; Br; C_1–C_4 alkyl; C_1–C_4 alkyl substituted with (a) OCH_3, (b) OC_2H_5, (c) CN or (d) 1–3 atoms of F, Cl or Br;
Y is also C_3–C_4 alkenyl; $CH_2C{\equiv}CR_{13}$; $A(CH_2)_{n'}A_1$-(C_1–C_3 alkyl); SCN; N_3; $NR_{16}R_{17}$; OR_{14} or SR_{15};
R_{13} is H, CH_3 or CH_2Cl;
n' is as previously defined, A is O or S and A_1 is O, S or SO_2;
R_{16} is H or CH_3;
R_{17} is H, OCH_3, C_1–C_6 alkyl, C_1–C_4 alkyl substituted with CN;
R_{17} is also C_3–C_4 alkenyl, C_3–C_6 cycloalkyl or C_2–C_3 alkyl substituted with (a) OCH_3 or (b) OC_2H_5;
R_{14} is C_1–C_4 alkyl; C_2–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br; C_1–C_4 alkyl substituted with CN; C_3–C_4 alkenyl; $CH_2C{\equiv}CR_{13}$; or

R_{15} is C_1–C_4 alkyl, allyl, propargyl or C_1–C_2 alkyl substituted with CN;
Z is CH;
provided that
(a) when Y has greater than or equal to 4 carbon atoms, then R has less than or equal to 4 carbon atoms;
(b) when X is Cl, then Y is Cl and when X and Y are both H, then R has less than or equal to 4 carbon atoms; and
(c) when W is O, R is C_1–C_4 alkyl; R_2, R_3 and R_4 are H; R_5 is H or CH_3; and X is H, CH_3, OCH_3 or OC_2H_5, then Y cannot be H, Cl, CH_3, OCH_3 or OC_2H_5.

4,592,979

PHOTOCONDUCTIVE MEMBER OF AMORPHOUS GERMANIUM AND SILICON WITH NITROGEN

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,730

Claims priority, application Japan, Sep. 9, 1983, 58-167072; Sep. 13, 1983, 58-170379; Nov. 7, 1983, 58-208811; Dec. 27, 1983, 58-244738; Dec. 28, 1983, 58-245301; Dec. 28, 1983, 58-245305

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—57 **70 Claims**

1. A photoconductive member comprising a substrate for photoconductive member and a light receiving layer having photoconductivity comprising an amorphous material containing silicon atoms and germanium atoms, germanium atoms, and at least one of hydrogen atoms and halogen atoms, and wherein the content of germanium atoms in the light receiving layer is 1 to 9.5×10^5 atomic percent based on the sum of germanium and silicon atoms, said light receiving layer containing nitrogen atoms and having a first layer region, a third layer region and a second layer region with the nitrogen atom content in the layer thickness direction of **C(1)**, **C(3)** and **(C)2**, respectively, in the order from the substrate side with the proviso that when **C(3)** cannot solely be the maximum and either one of **C(1)** and **C(2)** is zero, the other two are not zero and not equal to each other, or when **C(3)** is zero, the other two are not zero, or when none of **C(1)**, **C(2)** and **C(3)** is zero, the three of **C(1)**, **C(2)** and **C(3)** cannot be equal at the same time and **C(3)** cannot solely be the maximum.

4,592,980

PHOTOCONDUCTIVE LAYER HAVING HYDROPHILIC AND HYDROPHOBIC MOIETIES

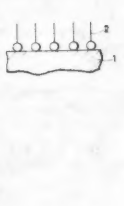
Yoshinori Tomida, Yokohama; Yutaka Hirai, Tokyo; Masahiro Haruta, Funabashi; Yukuo Nishimura, Sagamihara; Hiroshi Matsuda, and Takashi Hamamoto, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,253

Claims priority, application Japan, Dec. 5, 1983, 58-228381

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—57 **16 Claims**



1. A photoconductive member which comprises a substrate and at least one monomolecular layer on said substrate, said layer comprising a plurality of film-forming molecules, each molecule exhibiting photoconductivity and having a hydrophilic moiety and a hydrophobic moiety; wherein the layer is formed such that the hydrophilic moiety of each molecule is uniformly aligned and the hydrophobic moiety of each molecule is uniformly aligned.

2. The member of claim **1** comprising a plurality of said monomolecular layers on said substrate, in which the hydrophilic moieties in adjacent monomolecular layers uniformly oppose each other and the hydrophobic moieties in said adjacent monomolecular layers uniformly oppose each other.

4,592,981

PHOTOCONDUCTIVE MEMBER OF AMORPHOUS GERMANIUM AND SILICON WITH CARBON

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 649,850

Claims priority, application Japan, Sep. 13, 1983, 58-170383; Sep. 17, 1983, 58-172032; Dec. 28, 1983, 58-245307; Dec. 28, 1983, 58-245311; Dec. 29, 1983, 58-247252; Dec. 29, 1983, 58-247256

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—57 88 Claims

1. A photoconductive member comprising a substrate for photoconductive member and a light receiving layer having photoconductivity comprising an amorphous material containing silicon atoms and germanium atoms, and at least one of hydrogen atoms and halogen atoms, and wherein the content of germanium atoms in the light receiving layer is 1 to 9.5×10^5 atomic percent based on the sum of germanium and silicon atoms, said light receiving layer containing carbon atoms and having a first layer region, a third layer region and a second layer region with the carbon atom content in the layer thickness direction of C(1), C(3) and C(2), respectively, in the order from the substance side with the proviso that when C(3) cannot solely be the maximum and either one of C(1) and C(2) is zero, the other two are not zero and not equal to each other, or when C(3) is zero, the other two are not zero, or when none of C(1), C(2) and C(3) is zero, the three of C(1), C(2) and C(3) cannot be equal at the same time and C(3) cannot solely be the maximum.

4,592,982

PHOTOCONDUCTIVE MEMBER OF LAYER OF A-GE, A-SI INCREASING (O) AND LAYER OF A-SI(C) OR (N)

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 665,981

Claims priority, application Japan, Nov. 4, 1983, 58-207775; Dec. 13, 1983, 58-234790

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—57 32 Claims

1. A photoconductive member, having a substrate for photoconductive member, and a light receiving layer comprising (1) a first layer with a layer constitution in which a first layer region (G) comprising an amorphous material containing germanium atoms and a second layer region (S) exhibiting photoconductivity comprising an amorphous material containing silicon atoms are successively provided on said substrate from the aforesaid substrate side, and (2) a second layer comprising an amorphous material containing silicon atoms and at least one of carbon atoms and nitrogen atoms, said first layer having a layer region (O) containing oxygen atoms, comprising a zone wherein the depth profile of oxygen atoms in the layer thickness direction in said layer region (O) is increased smoothly and continuously toward the upper end surface of the first layer.

4,592,983

PHOTOCONDUCTIVE MEMBER HAVING AMORPHOUS GERMANIUM AND AMORPHOUS SILICON REGIONS WITH NITROGEN

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,791

Claims priority, application Japan, Sep. 8, 1983, 58-165652; Sep. 9, 1983, 58-166148; Oct. 11, 1983, 58-189592; Oct. 11, 1983, 58-189596; Oct. 21, 1983, 58-197335; Oct. 27, 1983, 58-201230

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—57 60 Claims

1. A photoconductive member comprising a substrate for photoconductive member and a light receiving layer having a layer constitution in which a first layer region (G) comprising an amorphous material containing germanium atoms and at least one of hydrogen or halogen atoms present in amounts from 0.01 to 40 atomic percent and a second layer region (S) exhibiting photoconductivity comprising an amorphous material containing silicon atoms and at least one of hydrogen or halogen atoms present in amounts from 0.01 to 40 atomic percent are successively provided from the substrate side, carbon atoms being present in at least said first layer region (G) and wherein the content of germanium atoms in said first layer region (G) is 1 to 10×10^{-5} atomic ppm based on the total of germanium and silicon.

4,592,984

MULTILAYER ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Yuji Nishigaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

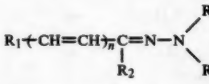
Continuation of Ser. No. 445,071, Dec. 9, 1981, abandoned. This application Jul. 9, 1984, Ser. No. 628,125

Claims priority, application Japan, Dec. 9, 1981, 56-199128

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—59 25 Claims

1. An electrophotographic photosensitive member comprising a photosensitive layer having a laminated structure of charge generation and charge transport layers on a conductive substrate, which is characterized in that the charge generation layer contains a copper phthalocyanine pigment of type epsilon and the charge transport layer contains a hydrazone compound represented by the following formula (I):



(I)

wherein R_1 represents substituted or unsubstituted aryl; R_2 represents hydrogen; R_2 and R_4 represent alkyl, aryl, or aralkyl, each substituted or unsubstituted; and n is 0 or 1, and a binder.

4,592,985

PHOTOCONDUCTIVE MEMBER HAVING AMORPHOUS SILICON LAYERS

Kyosuke Ogawa, Tokyo; Shigeru Shirai, Yamato; Keishi Saitoh, Tokyo; Teruo Misumi, Kawasaki, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,436

Claims priority, application Japan, Apr. 2, 1983, 58-58349

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—84 18 Claims

1. A photoconductive member, having a support, a first layer having photoconductivity containing an amorphous material comprising silicon atoms as a matrix provided on said support and a second layer containing silicon atoms and carbons atoms as essential components provided on said first layer, wherein said first layer contains at least one kind of atoms selected from the group III of the periodic table together with nitrogen atoms, with the nitrogen atoms having a substantially uniform concentration distribution within said first layer where the content of nitrogen atoms is 0.005 to 40 atomic % and the group III atoms of the periodic table having a depth concentration profile of said atoms with respect to the layer thickness direction where the maximum concentration is at the end surface on the side of said support or in the vicinity thereof and the concentration of said atoms tends to decrease continuously toward the second layer, and where the concentration distribution maximum of the group III atoms of the periodic table is in the range from 80 to 1×10^5 atomic ppm, the

concentration distribution minimum of the group III atoms of the periodic table is in the range from 1 to 1000 atomic ppm and the maximum of the concentration distribution is 2 times or more relative to the minimum of the concentration distribution.

4,592,986

MAGNETIC BRUSH ABRASION DEVELOPMENT OF IMAGING SHEETS EMPLOYING PHOTOSENSITIVE MICROCAPSULES

Erik K. Nelson, Centerville; Joseph G. O'Connor; David A. Boyer, both of Chillicothe, and Edward J. Saccocio, Columbus, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 14, 1985, Ser. No. 711,779
Int. Cl.[4] G03G *13/22*
U.S. Cl. 430—98 **16 Claims**

1. A method of rupturing photosensitive microcapsules which form a photosensitive layer on the surface of an imaging sheet comprising the steps of:

operating a magnetic brush such that a traveling pile of magnetically attractable free particles is formed on said magnetic brush; and

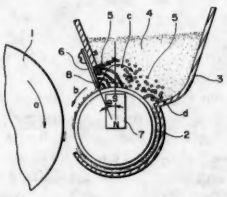
passing an imaging sheet over said magnetic brush such that said traveling pile moves over said microcapsules on the surface of said sheet and thereby ruptures said microcapsules.

4,592,987

TONER APPLICATION METHOD AND DEVELOPER COMPOSITION

Yasuo Mitsuhashi, Yokohama; Masanori Takenouchi, Urawa; Kenji Okado, Yokohama; Eiichi Imai, Naroshino, and Koshi Suematsu, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1984, Ser. No. 658,787
Claims priority, application Japan, Oct. 19, 1983, 58-195602
Int. Cl.[4] G03G *13/08, 13/09*
U.S. Cl. 430—102 **7 Claims**



1. A method for developing a latent electrostatic image comprising: forming, in a container containing a non-magnetic toner and magnetic particles for application of the toner, a magnetic brush of the magnetic particles;

circulating the magnetic particles in the container; and

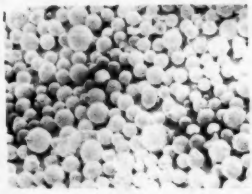
forming a thin layer of the toner triboelectrically charged on a toner carrying member inside of which a magnet for forming said magnetic brush is disposed; wherein the magnetic particles have a particle size distreibution of 30 wt. % or more in the range of 150 to 200 mesh and 5 wt. % or less of under 250 mesh, and the weight ratio of the toner to the magnetic particles is from 5:95 to 50:50 in the region where said magnetic brush is formed, and applying said thin layer of toner to develop said electrostatic image.

4,592,988

FERRITE TONER CARRIER CORE COMPOSITION DERIVED FROM FLY ASH

Robert G. Aldrich, Manlius; Geoffrey H. Earl, Erieville, and David W. Trunko, Lafayette, all of N.Y., assignors to Halomet, Inc., Syracuse, N.Y.

Filed Aug. 15, 1984, Ser. No. 640,813
Int. Cl.[4] G03G *9/00, 9/14, 9/10; C01G 49/08*
U.S. Cl. 430—107 **12 Claims**



1. A toner carrier composition comprising a ferrite toner carrier core composition derived from fly ash which is a mixture of spherical particulates of the general formula

$$\sum_{ijk} (M_x^{+1})_i (M_y^{+2})_j (M_z^{+3})_k Fe_2O_4$$

wherein iron is the principal metallic element and

i,j,k denote the number of atoms of monovalent, divalent and trivalent atoms present in one mole of the compound, and

M_x denotes monovalent atoms from Group IA of the Periodic Table,

M_y denotes divalent atoms from Group IIA of the Periodic Table,

M_z denotes trivalent atoms from Group IVB, Group IVA or Group IIIA;

wherein the particle size of the particulate is from 20 to 300 microns and the composition has an average saturation magnetization of 43 to 70 emu/g, an apparent density of 1.8 g/cm^3 or greater, a hardness of 7–8.0 Moh scale, and a resistivity of 10^8–10^{13} ohm-cm and from 0.1% to 2.0% by weight of an electrostatic carrier particle coating material.

4,592,989

TONER COMPOSITIONS CONTAINING COMPLEX IONOPHORIC POLYMERIC MATERIALS

Thomas W. Smith, Penfield; David M. Teegarden, Rochester; Kathleen M. McGrane, Rochester, and David J. Luca, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 12, 1985, Ser. No. 722,975
Int. Cl.[4] G03G *9/00, 9/08*
U.S. Cl. 430—110 **49 Claims**

1. An electrostatic toner composition comprised of resin particles, pigment particles, and a complex of a dipolar molecule or salt attached to an ionophoric polymer.

4,592,990

PROCESS FOR PRODUCING TONER

Seiichi Takagi, Tokyo; Yoshihiko Hyosu, Sagamihara, and Masumi Sasakawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,828

Claims priority, application Japan, Dec. 29, 1982, 57-231528; Dec. 29, 1982, 57-231529; Dec. 29, 1982, 57-231530; Feb. 18, 1983, 58-25652; Feb. 18, 1983, 58-25653; Feb. 18, 1983, 58-25654; Feb. 18, 1983, 58-25655; Feb. 18, 1983, 58-25656; Feb. 18, 1983, 58-25657; Feb. 18, 1983, 58-25658; Feb. 18, 1983, 58-25659; Feb. 18, 1983, 58-25660

Int. Cl.[4] G03G *4/00*

U.S. Cl. 430—137 22 Claims

22. A pseudo-capsule toner obtained by:

(a) mixing a polymerizable unsaturated monomer, a polar polymer selected from the group consisting of a cationic polymer and an anionic polymer, a colorant or a magnetic powder and a polymerization initiator to obtain a monomer system containing said unsaturated monomer, said colorant or magnetic powder, said polymerization initiator and said polar polymer dissolved in said unsaturated monomer;

(b) dispersing the obtained monomer system in an aqueous dispersion medium containing a dispersant having a charging polarity opposite to that of said polar polymer therein to form suspended particles of said monomer system in which said polar polymer collects at the surface of the suspended particles through electrostatic interaction with said dispersant; and

(c) suspension polymerizing said monomer system in said aqueous dispersion medium to obtain particles containing a polymer obtained from said monomer, said polar polymer and said colorant or said magnetic powder, wherein the resulting particles have a pseudo-capsule structure in which said polar polymer is concentrated at the surface of each of said particles for use as a toner.

4,592,991

SILVER HALIDE PHOTOGRAPHIC PRINTING PAPER

Tetsuo Yoshida; Tadayoshi Kokubo; Keiichi Adachi; Tadashi Ikeda, and Hidetoshi Kobayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 20, 1984, Ser. No. 684,402

Claims priority, application Japan, Dec. 22, 1983, 58-242717

Int. Cl.[4] G03C *5/16, 7/26, 1/02*

U.S. Cl. 430—139 13 Claims

1. A silver halide photographic printing paper comprising a support having on the support a photographic layer, containing a photographic emulsions and a silver halide developing agent, wherein an emulsified dispersion of an oil-soluble brightening agent in a high boiling point organic solvent having a specific inductive capacity of 7.5 or less is contained in the photographic layer.

4,592,992

DEVELOPER COMPOSITIONS FOR LITHOGRAPHIC PLATES

Shane Hsieh, Bridgewater, and Wayne A. Mitchell, Bound Brook, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Apr. 11, 1985, Ser. No. 721,981

Int. Cl.[4] G03C *5/00, 7/00*

U.S. Cl. 430—309 7 Claims

1. A method for preparing a photographic element which comprises imagewise light exposing a photographic element comprising a light sensitive negative working photographic composition which composition comprises a photosensitizer selected from the group consisting of a light sensitive diazo compound and a photopolymerizable composition which is disposed on a substrate and then removing the unexposed, non-image areas of said exposed element with an aqueous developer consisting essentially of, in admixture:

(a) from above 4.6% to about 27% by weight of α-hydroxy toluene; and

(b) from about 0.1% to about 30% of a C_{12} sodium alkyl ether sulfate; wherein the weight ratio of components a to b ranges from about 0.9–1.5:1; said developer having a vapor pressure of not more than about 0.15 mm Hg at 25° C. and a flash point of at least about 220° F. and said developer being capable of substantially completely removing said non-image areas in about 2 minutes or less while simultaneously removing substantially none of the exposed image areas; and substantially none of the material comprising said removed non-image areas is re-deposited back onto said photographic element.

4,592,993

PATTERN FORMING AND ETCHING PROCESS USING RADIATION SENSITIVE NEGATIVE RESIST

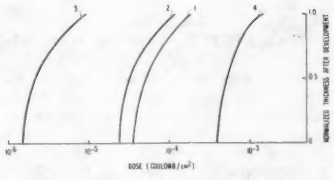
Yoshitake Ohnishi, Tokyo, and Takeshi Endo, Kanagawa, both of Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 527,622, Aug. 29, 1983, abandoned, which is a continuation of Ser. No. 317,819, Nov. 3, 1981, abandoned. This application Oct. 15, 1985, Ser. No. 787,695

Claims priority, application Japan, Nov. 5, 1980, 55-155351; May 25, 1981, 56-78967; May 25, 1981, 56-78968

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—313 9 Claims



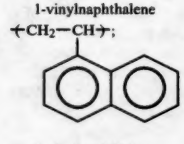
1. A pattern forming and etching process for use in microfabrication processes, said pattern and etching process comprising the steps of

(A) selectively exposing an article comprising a substrate and an overlying radiation sensitive layer consisting essentially of a polymeric material to radiation to form a pattern in which the ease of removal of the irradiated portions of said overlying layer by a developing agent is decreased;

(B) treating said overlying layer with said developing agent to selectively remove the unexposed portions thereof; and

(C) dry etching the article with etching gases whereby said article surface corresponding to the removed portions of the patterned overlying layer are preferentially etched; characterized in that said polymeric material consists of a polymer which contains at least 50 percent by monomeric unit ratio of one or a combination of monomeric units selected from the group of:

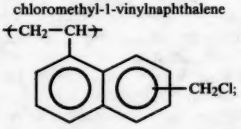
1-vinylnaphthalene



2-vinylnaphthalene

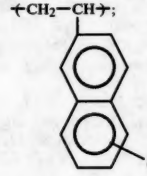
-continued

chloromethyl-1-vinylnaphthalene



and,

chloromethyl-2-vinylnaphthalene



wherein said polymer has a weight average molecular weight M_w within the range of 10,000 to 1,000,000 and wherein the polydispersivity of said polymer M_w/M_n, wherein M_n is number average molecular weight, is less than 5.

4,592,994

METHOD FOR THE DETERMINATION OF BIOCHEMICAL DATA

Bo G. Mattiasson, Lund, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

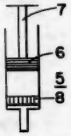
PCT No. PCT/SE82/00193, § 371 Date Jan. 28, 1983, § 102(e) Date Jan. 28, 1983, PCT Pub. No. WO82/04264, PCT Pub. Date Dec. 9, 1982

PCT Filed May 28, 1982, Ser. No. 464,498

Claims priority, application Sweden, Jun. 4, 1981, 8103520

Int. Cl.⁴ G01N *33/50*

U.S. Cl. 435—7 **15 Claims**



1. A method for the identification or determination of an entity selected from the group consisting of microorganisms and unicellular organisms in a sample which comprises:

(a) exposing the sample to an adsorbent having a specific binding power for said entity to bind said entity to said adsorbent;

(b) separating unbound sample from the adsorbent;

(c) exposing the adsorbent with bound entity to a nutrient-containing substrate to initiate metabolism of the entity, thereby causing the substrate to change its chemical or physical characteristics; and

(d) observing the changes of chemical or physical characteristics of the substrate caused by the metabolic process.

4,592,995

REAGENT FOR STREPTOCOCCAL ANTI-ESTERASE ASSAY

Seiki Hayano, Omiya; Kanae Yokogawa, Nara, and Shigeru Kurooka, Fujiidera, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 249,231, Mar. 30, 1981, abandoned. This application Nov. 16, 1983, Ser. No. 552,014

Int. Cl.⁴ G01N *33/573, 33/569, 33/554, 33/548, 33/552*

U.S. Cl. 435—7 **7 Claims**

1. A reagent kit for the quantitative determination of an antibody against an esterase from pathogenic streptococci in human blood serum, comprising:

(a) a predetermined quantity of an esterase from pathogenic streptococci, said predetermined quantity being at least immunochemically equivalent to the quantity of said antibody to be determined;

(b) a predetermined quantity of a protein-A, said protein-A being able to bind non-specifically to said antibody to be determined and being bound to an insoluble carrier, said predetermined quantity being at least immunochemically equivalent to the quantity of said antibody to be determined; and

(c) a predetermined quantity of a substrate reagent that measures esterase activity, which is selected from the group consisting of S-acetylthiophenol, naphthylacetate and nitrophenylacetate, and said predetermined quantity being sufficient to measure quantitatively the esterase in an esterase-anti-esterase antibody-insoluble protein-A complex.

5. A method for the quantitative determination of an antibody against an esterase from pathogenic streptococci in human blood serum comprising:

(a) adding at least an immunochemical euqivalent of an esterase from pathogenic streptococci to human blood serum containing said antibody to be determined;

(b) adding to the mixture of step (a) at least an immunochemical equivalent of a protein-A, said protein-A being able to bind non-specifically to said antibody to be determined and being bound to an insoluble carrier to form an esterase-anti-esterase antibody-insoluble protein-A complex;

(c) separating said complex from the mixture of step (b) by centrifugation; and

(d) mesuring the activity of the esterase in said complex by using a substrate which is selected from the group consisting of S-acethylthiophenol, naphthylacetate and nitrophenlacetate.

4,592,996

PROCESS FOR DETERMINING REDUCED FORM COENZYMES

Kazuhiko Yamanishi, Tokyo, and Toshiro Hanada, Kawagoe, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed May 10, 1984, Ser. No. 608,681

Claims priority, application Japan, May 10, 1983, 58-81153

Int. Cl.⁴ C12Q *1/60, 1/32, 1/28;* C12N *9/96*

U.S. Cl. 435—11 **12 Claims**

1. A process for determining a reduced form coenzyme, NADH or NADPH, which comprises acting a peroxidase on a reduced form coenzyme in the presence of Mn^{2+} or Co^{2+} metal ions in the range of about 0.1 m mole/l. to 200 m mole/l., to generate hydrogen peroxide, and measuring the amount of hydrogen peroxide colorimetrically.

4,592,997

PROCESS FOR THE DETECTION OF THE PRESENCE OF AN ALLERGY AND FOR THE SPECIFIC DETECTION OF THE ALLERGEN RESPONSIBLE FOR THE ALLERGY

Otto-Henning Wilhelms, Weinheim-Rittenweier; Peter Stahl, Bernried, and Peter Wunderwald, Haunshofen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,452

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211254

Int. Cl.[4] C12Q *1/38;* G01N *53/00*

U.S. Cl. 435—23 16 Claims

1. A process for detection of the presence of an allergy and for determination of a specific allergen responsible for that allergy in a sample which comprises leukocytes, said process comprising determination of a protease liberated from said leukocytes in the presence of allergens, said protease characterized by specific apritonin I^{50} inhibitability of about 1 mg/ml, specific soyabean trypsin inhibitor inhibitability of about 50 to about 100% at 0.05 m Mole/liter of said inhibitor, and a pH optimum of from about 6.8 to about 8.2, determination comprising the steps of incubating leukocytes of the sample to be investigated with an allergen or other stimulation factor of degranulation to liberate said protease, separating and removing the leukocytes from the incubated sample, and incubating the solution after removal of the leukocytes with a compound of general formula:

Y—X—C

in which Y is an amino acid or a peptide containing 2 or 3 amino acids, X is arginine or lysine and C is a chromogenic residue, in the presence of a buffer effective at pH 6.3 to 8.0, said protease liberating the chromogenic residue, and thereafter measuring the chromogenic residue.

4,592,998

PROCESS FOR COUPLING BIOLOGICAL SUBSTANCES BY COVALENT BONDS

Stratis Avrameas, La Celle Saint Cloud, and Thérèse M. F. Ternynck, Paris, both of France, assignors to Etablissement Declare d'Utilite Publique Dit: Institut Pasteur, Paris, France

Continuation of Ser. No. 250,368, Apr. 2, 1981, abandoned, which is a continuation of Ser. No. 79,929, Sep. 28, 1979, abandoned, which is a division of Ser. No. 746,552, Dec. 1, 1976, Pat. No. 4,193,982. This application Dec. 15, 1983, Ser. No. 561,629

Claims priority, application France, Dec. 5, 1975, 75 37392

The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.

Int. Cl.[4] C12Q *1/28;* C12N *11/10, 11/00, 11/16*

U.S. Cl. 435—28 17 Claims

1. In a process for coupling at least two substances by covalent bonds by means of a cross-linking agent, said cross-linking agent being benzoquinone, the improvement comprising the steps of

(a) mixing a first substance dissolved in solution with at least about 200 times its molar amount of benzoquinone, this reaction known as the activation reaction being performed in a homogeneous liquid medium, said first substance being selected from the group consisting of proteins, glycoproteins other than Fab fragments of immunoglobulins, polysaccharides and nucleic acids

(b) removal of the reaction products of step (a) and the excess benzoquinone and recovery of the activated first substance;

(c) contacting the activated first substance with the second substance to be coupled, said second substance being selected from the group consisting of proteins, glycoproteins, polysaccharides, nucleic acids and red blood cells.

4,592,999

PROCESS FOR PRODUCING DAUNOMYCIN

Hamao Umezawa; Tomio Takeuchi; Kageaki Kouno, all of Tokyo; Tomoyuki Ishikura, Chigasaki; Akihiro Yoshimoto, Fujisawa; Yukio Takatsuki, Yokohama, and Hiroyasu Tobe, Tokyo, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,678

Claims priority, application Japan, Jul. 24, 1982, 57-129370

Int. Cl.[4] C12P *19/56;* C12R *1/34*

U.S. Cl. 435—78 1 Claim

1. A process for producing daunomycin which comprises culturing in a nutrient medium a mutant strain capable of producing daunomycin and incapable of producing daunomycin analogues, said mutant strain being derived from strains capable of producing daunomycin and daunomycin analogues simultaneously wherein said mutant strain is *Streptomyces coeruleorubidus* 3T-373, and recovering daunomycin thus produced from the broth.

4,593,000

METHOD OF PRODUCING GUANOSINE

Yasuhiro Sumino, Kobe; Koji Sonoi, Suita, and Muneharu Doi, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 389,458, Jun. 17, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 688,286

Claims priority, application Japan, Jun. 22, 1981, 56-97309

Int. Cl.[4] C12P *19/40;* C12N *1/00*

U.S. Cl. 435—88 2 Claims

1. A method of producing guanosine which comprises growing a guanosine-producing microorganism, which requires adenine for its growth, in a medium and recovering guanosine thus produced and accumulated in the resultant fermentation broth from said broth, wherein incubation is conducted in a batch system and is started in a medium containing not more than about 50% of the quantity of an adenine-containing material required for maximal production and accumulation of the guanosine, and after the adenine-containing material in the medium has been almost completely consumed, the incubation is continued with intermittent or continuous addition of the remaining quantity of said adenine-containing material required for growth of the microorganism in accordance with the formula:

$$F(t)=F(O)\exp(Kt)$$

wherein F(t) is the dose of the adenine-containing material per unit time interval (feed rate), F(O) is the feed rate at the time of starting the addition, K is a constant (specific feed rate) and t is time after commencement of the addition of the adenine-containing material, wherein F(O) is about 0.1 to 50% and K is about 0.01 to 5 hr^{-1}.

4,593,001

HIGH TEMPERATURE ISOMERIZATION PROCESS

Robert O. Horwath, Westport, Conn., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jan. 9, 1984, Ser. No. 569,377

Int. Cl.[4] C12P *19/24;* C12N *9/92;* C12R *1/06*

U.S. Cl. 435—94 3 Claims

1. A method of isomerizing glucose to fructose comprising contacting a glucose containing solution, under isomerization conditions, at a temperature between about 90° C. to about 110° C. and a pH within the range of about 6.5 to 7.0, with a thermostable glucose isomerizing enzyme obtained from a biologically pure culture of a strain of microorganism, having the identifying characteristics of Arthrobacter sp. ATCC 21748.

4,593,002

VIRUSES WITH RECOMBINANT SURFACE PROTEINS

Renato Dulbecco, La Jolla, Calif., assignor to Salk Institute Biotechnology/Industrial Associates, Inc., San Diego, Calif.

Filed Jan. 11, 1982, Ser. No. 338,416
Int. Cl.[4] C12N *15/00, 7/00, 7/02, 1/00;* C12P *21/00, 21/02, 21/04, 19/34;* A61K *39/12, 37/00*
U.S. Cl. 435—172.3 8 Claims

1. A method of modifying a virus to give the virus a new biological function comprising inserting a foreign nucleotide base sequence into the viral genome at a location whereat said foreign nucleotide base sequence expresses itself as an exposed segment of a surface viral protein, which surface viral protein forms a part of the coat of the modified virus.

4,593,003

BACTERIAL METHOD AND COMPOSITIONS FOR ISOPRENOID DEGRADATION

Peter A. Vandenbergh, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed May 19, 1983, Ser. No. 496,140
Int. Cl.[4] C12N *15/00, 1/00, 1/20;* C07G *17/00*
U.S. Cl. 435—172.3 27 Claims

1. The method for the degradation of isoprenoid compounds with a bacterium of the genus Pseudomonas which comprises:

(a) degrading an isoprenoid with a strain of *Pseudomonas putida* containing the plasmid pSRQ50 as carried in *Pseudomonas putida* NRRL-B-15169, 15170, 15171, 15174 or 15175, wherein the Pseudomonas has been cultured prior to being added to the isoprenoid to produce the degradation.

4,593,004

PROCESS FOR THE IMMOBILIZATION OF CYCLODEXTRINE GLYCOSYLTRANSFERASE ENZYME

László Boross; Iván Daróczi; Katalin Ivony nee Kaldive, all of Budapest; Gábor Seres, Halásztelek; Béla Szanjáni, and József Szejtli, both of Budapest, all of Hungary, assignors to Reanal Finomvegyszergyar, Budapest, Hungary

Filed Aug. 24, 1983, Ser. No. 526,034
Claims priority, application Hungary, Aug. 24, 1982, 2716/82
Int. Cl.[4] C12N *11/06, 11/02, 11/10, 11/08*
U.S. Cl. 435—181 12 Claims

1. A process for the immobilization of cyclodextrin glycosyl transferase enzyme which comprises the steps of:

(a) activating a cyclodextrin glycosyl transferase enzyme either in an aqueous solution with a carbodiimide compound that is water-soluble, at a temperature of 0° to 4° C. or in an organic solvent with a carbodiimide compound that is soluble in an organic solvent, at a temperature less than 0° C; and

(b) immobilizing the enzyme by applying the enzyme treated according to step (a) in an aqueous buffer solution having a pH value between 4.5 and 8.5 onto a carrier which is a derivative of a polysaccharide compound comprising at least 0.1 m. equiv. of NH_2 groups per gram of carrier, and washing the product.

7. A process for the immobilization of cyclodextrin glycosyl transferase enzyme which comprises the steps of:

(a) activating a polymer carrier comprising at least 0.1 m. equiv. of functional —COOH groups per gram of carrier, said polymer carrier having been produced from an acrylic acid and/or methacrylic acid, or acrylic amide and/or methacrylic amide monomer, and a cross-linking agent of the acrylic or allylic type either in an aqueous solution with a carbodiimide compound that is water soluble, at a temperature of 0° to 4° C. or in an organic solvent with a carbodiimide compound that is soluble in an organic solvent, at a temperature less than 0° C; and

(b) applying a cyclodextrin glycosyl transferase enzyme in an aqueous buffer solution having a pH value of 4 to 9 onto the polymer carrier to immobilize the enzyme, and washing the product.

4,593,005

STRAINS OF ASPERGILLUS AND USE THEREOF TO PRODUCE AMYLOLYTIC ENZYMES

Susumu Hizukuri, Kagoshima, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Filed Aug. 6, 1984, Ser. No. 638,063
Claims priority, application Japan, Aug. 8, 1983, 58-144544
Int. Cl.[4] C12N *9/30, 1/14;* C12P *19/14, 7/14;* C12R *1/68*
U.S. Cl. 435—203 10 Claims

1. A biologically pure culture of Aspergillus K27 AC-1 (FERM BP-568) which has the same taxonomical characteristics as *Aspergillus fumigatus* except that

(1) its conidiophore is colorless and

(2) it grows at temperatures of from 10° C. to 55° C.

9. A process for producing amylolytic enzymes which comprises cultivating in a culture medium a novel strain of Aspergillus K27 AC-1 (FERM BP-568) which has the same taxonomical characteristics as *Aspergillus fumigatus* except that

(1) its conidiophore is colorless and

(2) it grows at temperatures of from 10° C. to 55° C. to produce said amylolytic enzymes.

4,593,006

COMPOSITION FOR MULTILAYER PRINTED WIRING BOARD

Mitsuo Takabatake; Jiro Chiba, both of Yokohama, and Yoshinori Kokubu, Tokyo, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,211
Int. Cl.[4] C03C *14/00, 3/091, 3/064*
U.S. Cl. 501—32 5 Claims

1. A composition for a multilayer printed wiring board, consisting essentially of from 25 to 65% by weight of glass powder, from 0 to 60% by weight of alumina powder and from 5 to 60% by weight of forsterite powder, said glass powder consisting essentially of from 25 to 70% by weight of SiO_2, from 4 to 15% by weight of Al_2O_3, from 25 to 45% by weight of B_2O_3 and from 0.5 to 30% by weight of BaO.

4,593,007

ALUMINUM AND SILICA CLAD REFRACTORY OXIDE THERMAL SPRAY POWDER

Edward R. Novinski, East Williston, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 6, 1984, Ser. No. 678,869
Int. Cl.[4] C04B *35/48;* B05D *1/08*
U.S. Cl. 501—105 10 Claims

1. A thermal spray powder characterized by ability to produce an abradable and erosion resistant coating, consisting essentially of particles having a central core of a material selected from the group consisting of zirconium oxide, magnesium oxide, hafnium oxide, cerium oxide, yttrium oxide and combinations thereof, and aluminum and silicon dioxide homogeneously bonded to the surface of said core; the powder particles having a size between about 149 microns and 5 mi-

crons; and said aluminum being present in an amount between 0.5% and 15% by weight, and said silicon dioxide being present in an amount between 0.5% and 20% by weight, based on the total of the aluminum and the core material.

4,593,008

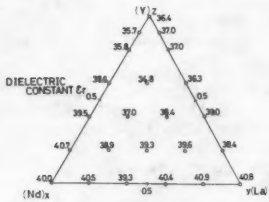
DIELECTRIC CERAMIC MATERIAL COMPOSITION

Takashi Ôkawa, Kokubu, and Nobuo Yokoe, Hayato, both of Japan, assignors to Kyocera Corporation, Japan

Filed Aug. 23, 1985, Ser. No. 768,620

Int. Cl.[4] C04B *35/50, 35/00*

U.S. Cl. 501—135 **7 Claims**



1. A dielectric material composition having the following composition formula:

$$Ba(Nd_{x/2}La_{y/2}Y_{z/2}Nb_4)O_3 \quad (1)$$

wherein x, y and z are positive numbers satisfying requirements of $x+y+z=1$, $1 \geqq x \geqq 0$, $1 \geqq y \geqq 0$ and $1 > z \geqq 0$, and having a perovskite structure.

4,593,009

CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

Thomas E. Nowlin, Yanbu, Saudi Arabia, assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,777

Int. Cl.[4] C08F *4/64, 4/68*

U.S. Cl. 502—107 **58 Claims**

1. A process for preparing a supported catalyst composition for use in alpha-olefin polymerization reactions which comprises the steps of:

(i) contacting a solid, porous carrier having reactive OH groups with a liquid, said liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R and R′ are the same or different and they are C_1–C_{12} hydrocarbyl groups, provided that R′ may also be halogen, and n is 0, 1 or 2, the number of moles of said organomagnesium composition being in excess of the number of moles of the OH groups on said carrier;

(ii) removing said liquid from step (i) to obtain a magnesium-containing carrier in the form of a dry, free-flowing powder, said dry, free-flowing powder containing a stoichiometric molar excess of the magnesium-containing compounds with respect to the OH groups originally present on said carrier; and

(iii) contacting said powder of step (ii) with a solution comprising a liquid medium and at least one tetravalent vanadium compound, said vanadium compound being soluble in said liquid medium, and said magnesium-containing carrier being substantially insoluble in said liquid medium, whereby a compound of vanadium which is insoluble in said liquid medium becomes incorporated onto said carrier.

2. A process of claim 1 wherein the number of moles of said vanadium compound present in said solution of step (iii) is in excess of the stoichiometric amount thereof.

3. A process of claim 2 wherein the solid, porous carrier, prior to contact thereof with the liquid in step (i), is heated at a temperature of about 100° C. to about 1000° C.

4,593,010

POLYETHYLENE WITH BROAD MOLECULAR WEIGHT DISTRIBUTION

Dennis B. Malpass, LaPorte, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 31, 1983, Ser. No. 528,185

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—115 **13 Claims**

8. An ethylene polymerization catalyst system comprising (a) Group IVb to VIb transition metal compound, (b) isoprenylaluminum and (c) a halogenated hydrocarbon.

9. The catalyst of claim 8 wherein the transition metal compound is one of trivalent or tetravalent titanium alkoxide, aryloxide, halide, or oxyhalide.

11. The catalyst of claim 9 wherein the transition metal compound is reacted with a magnesium compound selected from one of $RMgX$, R_2Mg, $RMgOR$, $R_2Mg.R_3Al$, $R_2Mg.R_3B$, $R_2Mg.R_2Zn$, $R_2Mg.R_3Ga$ wherein R can be the same or different hydrocarbyl groups having from 1 to 20 carbon atoms.

4,593,011

HYDROFORMYLATION PROCESS USING TRIARYLPHOSPHINE AND BISPHOSPHINE MONOOXIDE LIGANDS

Anthony G. Abatjoglou, Charleston, and David R. Bryant, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 293,189, Aug. 17, 1981, Pat. No. 4,491,675.

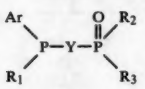
This application Oct. 11, 1984, Ser. No. 659,895

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] B01J *31/24*

U.S. Cl. 502—161 **7 Claims**

1. A rhodium complex hydroformylation catalytic precursor composition consisting essentially of a solubilized rhodium carbonyl phosphorus acetylacetonate complex, and organic solvent, free triarylphosphine ligand and free organic tertiary bisphosphine monooxide ligand having the general formula



wherein Ar represents an identical or different substituted or unsubstituted aryl radical, and R_1, R_2 and R_3 group represents an identical or different substituted or unsubstituted monovalent hydrocarbon radical and Y represents a divalent bridging group; and wherein the mole ratio of free triarylphosphine ligand to free bisphosphine monooxide ligand present in said composition ranges from about 2:1 to about 30 to 1.

4,593,012

PRODUCTION OF HYDROCARBON-SOLUBLE SALTS OF MOLYBDENUM FOR EPOXIDATION OF OLEFINS

Masahiro Usui, and Yasuhiko Higashio, both of Chiba, Japan, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 5, 1985, Ser. No. 708,480

Claims priority, application Japan, Mar. 9, 1984, 59-46145

Int. Cl.[4] B01J *31/04*

U.S. Cl. 502—167 **12 Claims**

1. The method of producing a hydrocarbon-soluble molybdenum-containing salt, useful as a catalyst for the epoxidation of an olefinic compound with an organic hydroperoxide, which comprises reacting an ammonium molybdate with a

carboxylic acid in the presence of an organic amine at a temperature from about 150° C.to about 250° C., while removing water.

4,593,013

LAYERED COMPOUNDS OF PEROVSKITE RELATED OXIDES AND ORGANIC BASES

Allan J. Jacobson, Princeton; Jack W. Johnson, Clinton, and Joseph T. Lewandowski, Whitehouse Station, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 26, 1985, Ser. No. 716,040
Int. Cl.[4] B01J *31/02*
U.S. Cl. 502—167 16 Claims

1. A composition of matter represented by the formula

$$Z_aH_bM_c[A_{n-1}B_nO_{3n+1}]$$

where Z is one or more organic bases having conjugate acids with pKa values greater than about 3; H is hydrogen, M is one or more of K, Rb, Cs, NH_4, Li, Na, Tl, and Ag; $0<a\leqq 2$, $c<1$, and $b+c=1$; A is one or more mono-, di-, and trivalent cations selected from Groups 1a, 2a, and 3b of the Periodic Table of the Elements and the lanthanides; B is one or more transition metals selected from Re, and Groups 4b, 5b, and 6b of the Periodic Table of the Elements; and n is an integer from 3 to 7.

4,593,014

CATALYST SUPPORT COMPOSITIONS

Albert P. Halluin, Danville, Calif., and Allan E. Barnett, Westfield, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 388,967, Jun. 16, 1982, Pat. No. 4,497,907. This application Jan. 22, 1985, Ser. No. 693,364
Int. Cl.[4] B01J *21/06, 21/12*
U.S. Cl. 502—242 1 Claim

1. A catalyst support composition consisting essentially of alumina and titania at a weight ratio of about 0.3:1 to 1:0.3 respectively, and solid porous particles selected from the group of kieselguhr, infusorial earth, diatomaceous earth, and siliceous earth.

4,593,015

CATALYST FOR THE PREPARATION OF ALCOHOLS FROM SYNTHESIS GAS

Harley F. Hardman, Lyndhurst, and Ronald I. Beach, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 639,512, Aug. 7, 1984, Pat. No. 4,540,713, which is a continuation of Ser. No. 503,076, Jun. 13, 1983, abandoned, which is a continuation of Ser. No. 393,829, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 54,216, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 905,703, May 15, 1978, abandoned. This application Jun. 13, 1985, Ser. No. 744,402
Int. Cl.[4] B01J *23/04, 23/10, 23/12, 23/72*
U.S. Cl. 502—303 10 Claims

1. A catalyst comprising an oxide complex of the empirical formula:

$$Cu_aThM_bA_cO_x$$

wherein
M is one or more of Ca, Rh, Pt, Al, La, Re, Ru or Pd;
A is an alkali metal; and
wherein
a is 0.5 to 2.5;
b is 0.01 to 1.0;
c is 0.05 to 0.9; and
x is a number such that the valence requirements of the other elements for oxygen is satisfied.

4,593,016

PROCESS FOR MANUFACTURING A CONCENTRATE OF A PALLADIUM-TIN COLLOIDAL CATALYST

William J. Amelio, Binghamton; Dae Y. Jung; Voya Markovich, both of Endwell, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1985, Ser. No. 701,585
Int. Cl.[4] B01J *23/14, 23/44*
U.S. Cl. 502—339 17 Claims

1. Process for the manufacture of a concentrate of a palladium-tin colloidal catalyst which comprises:

(a) dissolving a source of stannous chloride calculated as about 550 grams to about 650 grams of $SnCl_2\times 2H_2O$ per liter of said concentrate in about 0.18 to about 0.21 liters of concentrated aqueous HCl per liter of said concentrate to thereby obtain a stannous chloride solution;

(b) diluting said stannous chloride solution obtained from step (a) with aqueous concentrated HCl to thereby obtain about 0.3 to about 0.5 liters of diluted solution per liter of said concentrate;

(c) further diluting said diluted solution from step (b) with deionized water to provide about 0.45 to about 0.55 liters of diluted stannous chloride solution per liter of said concentrate;

(d) dissolving about 9 to about 12 grams of $PdCl_2$ per liter of said concentrate in aqueous HCl to obtain a $PdCl_2$ having about 0.04 to about 0.06 liters of HCl per liter of said concentrate to thereby obtain about 0.35 to about 0.45 liters of diluted palladium chloride solution per liter of concentrate;

(e) cooling the solution from steps (c) and (d) to normal room temperatures or below;

(f) gradually adding the diluted palladium chloride solution cooled pursuant to step (e) to the diluted stannous chloride solution cooled pursuant to step (e), and mixing to obtain a homogeneous solution;

(g) then increasing the temperature of the homogeneous solution from step (f) from about normal room temperatures at a rate of about 0.5° to about 1° C. per minute until a temperature of about 105° C. to about 110° C. is reached and held at said temperature for a time sufficient to obtain a homogeneous solution of substantially uniform colloidal palladium-tin particles; and

(h) slowly cooling said homogeneous solution to about room temperature.

4,593,017

METHODS OF TREATING PATIENTS USING A PHARMACEUTICAL PREPARATION CONTAINING AN α-ENDORFINE FRAGMENT

David de Wied, Bilthoven, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 14, 1983, Ser. No. 504,276
Claims priority, application Netherlands, Jun. 14, 1982, 8202403
Int. Cl.[4] A61K *37/00, 49/00;* G01N *31/00, 33/48*
U.S. Cl. 514—16 3 Claims

1. Method for stimulating endogenous vasopressin release in patients which comprises administering a vasopressin-releasing effective amount of a peptide having the formula I:

H-R(1)-Gly-L-Phe-R(2)-L-Thr-L-Ser-L-Glu-L-Lys-OH (I)

wherein R(1) represents Gly or L-Ala and R(2) represents L-Met, L-Met(O) or L-Met(O_2), a physiologically acceptable or C-terminal C_1–C_6 aliphatic ester or a C-terminal unsubstituted mono- or di-methyl amide thereof, together with one or more pharmaceutically acceptable carriers.

4,593,018
OLIGOPEPTIDE ALDEHYDES USEFUL AS SPECIFIC INHIBITORS OF ENTEROKINASE

Brian M. Austen; Steven Cliffe; David Grant, and John Hermon-Taylor, all of London, England, assignors to National Research Development Corp., London, England

PCT No. PCT/GB84/00152, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04301, PCT Pub. Date Nov. 8, 1984

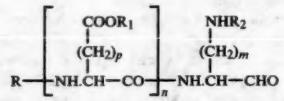
PCT Filed May 4, 1984, Ser. No. 690,486

Claims priority, application United Kingdom, May 5, 1983, 8312339

Int. Cl.[4] C07K *7/02, 7/06, 5/08;* **A61K** *37/43*

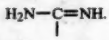
U.S. Cl. 514—16 **10 Claims**

1. A compound of the general formula:



I

wherein n is an integer from 2 to 6, m is an integer from 2 to 4, p is an integer from 1 to 3, R is H, an amino protecting group conventionally used in peptide chemistry or a solid phase support, R_1 is H or a carboxy protecting group conventionally used in peptide chemistry and R_2 is H or alkyl or



4,593,019
N^6-TRICYCLIC ADENOSINES

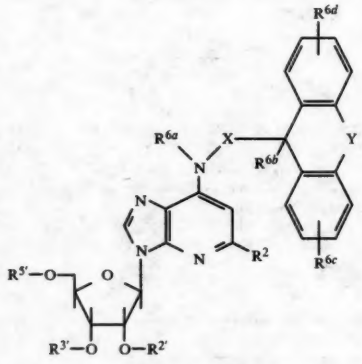
James A. Bristol; Walter Moos, both of Ann Arbor, and Bharat K. Trivedi, Canton, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 26, 1984, Ser. No. 665,219

Int. Cl.[4] A61K *31/70;* **C07H** *19/06*

U.S. Cl. 514—46 **12 Claims**

1. A compound of the formula:



wherein R^{6a} is hydrogen or lower alkyl; R^{6b} is hydrogen, hydroxy, lower alkyl, lower alkanoyloxy- or benzoyloxy; R^{6c} and ^{6d} are each independently hydrogen or one or more substituents selected from halogen, hydroxy, lower alkoxy, lower alkanoyloxy, benzoyloxy, lower S(O)n-alkyl in which n is 0, 1, or 2, sulfonamide, trifluoromethyl, lower alkyl, lower mono- or dialkylamino, nitro or sulfhydryl; X is a valence bond or a straight or branched alkylene of 1 to 8 carbon atoms; Y is a valence bond, oxygen, sulfur, NR in which R is hydrogen, lower alkyl, lower alkanoyl or benzoyl, $-(CH_2)n-$ in which n is 1 or 2 or $-CH{=}CH-$; R^2 is hydrogen, halogen, NR^iR^{ii}, or^i or SR^i in which R^i and R^{ii} are each independently hydrogen, lower alkyl or phenyl, lower alkyl; $R^{2'}$, $R^{3'}$, and $R^{5'}$ are each independently hydrogen, lower alkanoyl, benzoyl, benzoyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, or $R^{2'}$ and $R^{3'}$ may be bonded together to form a lower alkylidene group, on a pharmaceutically acceptable acid form salt thereof.

11. A pharmaceutical composition for treating psychosis comprising an antipsychotic effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

12. A method of treating psychosis in a mammal suffering therefrom comprising administering to such mammal an antipsychotic effective amount of a compound as claimed in claim 1 in unit dosage form.

4,593,020
THERAPEUTIC METHODS FOR THE TREATMENT OF HANGOVER

Philippe M. Guinot, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques, Paris, France

Filed Sep. 24, 1984, Ser. No. 654,208

Claims priority, application United Kingdom, Sep. 24, 1983, 8325627

Int. Cl.[4] A61U *31/16, 31/20, 31/52, 31/60*

U.S. Cl. 514—159 **12 Claims**

1. A method of treating a human in need of relief of hangover symptoms resulting from overindulgence of ethanol, said method comprising orally administering to said human a therapeutically effective amount of an admixture comprising betaine citrate and a pharmaceutically acceptable carrier.

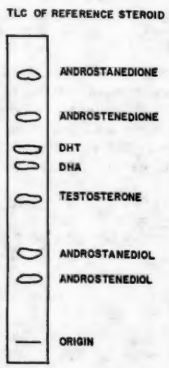
4,593,021
TREATMENT OF SKIN OVER ANDROGENICITY USING COMPOSITIONS CONTAINING PREGNENOLONE

Sung L. Hsia; Walter Voigt; Marty Sawaya, and Kathryn Zeoli, all of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Aug. 16, 1984, Ser. No. 641,201

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—182 **3 Claims**



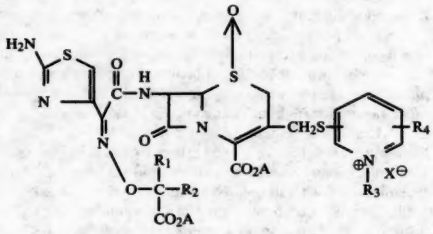
1. A method of treating acne vulgaris resulting from over androgenicity of the skin, comprising topically applying a therapeutically effective amount of pregnenolone to the acne-containing areas of the skin of a person in need of such treatment.

4,593,022
DERIVATIVES OF PYRIDINIUM THIOMETHYL CEPHALOSPORINS

Bernard Labeeuw, Montpellier, and Ali Salhi, Saint-Gely-du-Fest, both of France, assignors to Sanofi, Paris, France

Filed Nov. 15, 1982, Ser. No. 441,757
Claims priority, application France, Nov. 16, 1981, 81 21385
Int. Cl.⁴ C07D *501/38;* A61K *31/545*
U.S. Cl. 514—206 **11 Claims**

1. Cephalosporins having the formula:



wherein

R_1 is H or CH_3; R_2 is CH_3; or R_1 and R_2 taken together constitute a 1,3-propylene group;

R_3 is an alkyl, alkenyl, or alkynyl group of from one to four carbons; or a $CH_2COOAlk$ group wherein Alk is alkyl of from one to four carbons;

R_4 denotes or OH occupying a free position on the pyridine ring; the atom of sulfur of the thiomethyl group being bonded to the 2 or 4 position of the pyridine;

A is selected from the group consisting of

hydrogen;

alkali metal cations;

alkaline earth cations;

cations, resulting from protonation of a compound selected from the group consisting of ethylenediamine, ethanolamine, and tromethamine;

tertiary butyl;

organic radicals selected from the group consisting of phthalidyl; pivaloyloxymethyl, acetoxymethyl, ethoxycarbonyloxymethyl, 1-(ethoxycarbonyloxy) ethyl, acetonyl, α-methoxy α-carbomethoxymethyl, carbomethoxymethyl, and carbethoxymethyl;

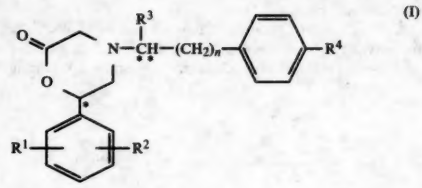
$X^{\ominus}$ represents an anion selected from the group consisting of chloride, bromide, acetate, trifluoroacetate, formate, and the carboxylate anion derived from the carboxyl group located on the 4-position of the cepheme ring system; or a pharmaceutically acceptable acid addition salt of the compound in which A is H, tertiary butyl, or said organic radical.

4,593,023
6-OXOMORPHOLINES

Richard M. Hindley, Reigate, England, assignor to Beecham Group p.l.c., England

Filed May 17, 1985, Ser. No. 735,357
Claims priority, application United Kingdom, May 19, 1984, 8412862
Int. Cl.⁴ A61K *31/535;* C07D *265/32*
U.S. Cl. 514—233 **14 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, in which

R^1 is hydrogen, halogen, or trifluoromethyl,

R^2 is hydrogen or halogen,

R^3 is hydrogen or methyl,

R^4 is $-O(CH_2)_aCO_2H$, $-O(CH_2)_bM$, $-CO_2H$ or an ester or amide derivative thereof in which

a is an integer from 1 to 6

b is an integer from 2 to 7, and

M is hydroxy, C_{1-6} alkoxy or

in which

R^5 and R^6 are each hydrogen or C_{1-6} alkyl

or

together form a five or six membered ring, and

n is 1 or 2.

11. A method for treating obesity in human or non-human animals, which method comprises administering an effective, non-toxic amount of a compound of formula (I) according to claim **1**, or a pharmaceutically acceptable salt thereof to an obese human or non-human animal.

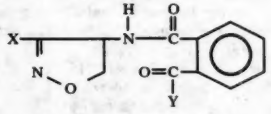
12. A method for treating hyperglycaemia in human or non-human animals which method comprises administering an effective, non-toxic amount of a compound of formula (I) according to claim **1**, or a pharmaceutically acceptable salt thereof to a hyperglycaemic human or non-human animal.

4,593,024
DIHYDROISOXAZOLE COMPOUNDS AND ANTHELMINTIC USE

Jing-jong Lu, and Herbert L. Wehrmeister, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Aug. 15, 1985, Ser. No. 765,964
Int. Cl.⁴ A61K *31/42, 31/535;* C07D *261/04, 413/12*
U.S. Cl. 514—234 **12 Claims**

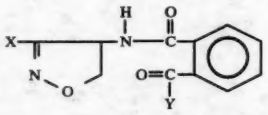
1. Anthelmintic compounds of the formula:



wherein X is chlorine or a dialkylamino group, and Y is a dialkylamino group, when X is a dialkylamino group it is the same group as Y, said dialkylamino group being selected from

the group consisting of: diethylamino, morpholino, pyrrolidino and methylpiperazino.

6. A method of treating mammals and fowl which are infested with parasitic worms which comprises oral administration to said infested animals of an anthelmintic compound of the formula:



wherein X is chlorine or a dialkylamino group, and Y is a dialkylamino group, wherein the dialkylamino group is selected from the group consisting of: diethylamino, morpholino, pyrrolidino and methylpiperazino.

4,593,025

TRIAZINE DERIVATIVES TO TREAT PAIN, FEVER, INFLAMMATION, ALLERGIES AND THROMBOSIS

Kenji Sempuku, Suita; Yoshihisa Shibata, Kameoka, and Tadaaki Ohgi, Nagaokakyo, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Division of Ser. No. 560,445, Dec. 12, 1983, Pat. No. 4,554,275. This application Jun. 12, 1985, Ser. No. 744,047

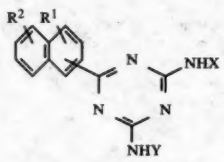
Claims priority, application Japan, Dec. 10, 1982, 57-217529

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/53*

U.S. Cl. 514—245 **12 Claims**

1. A method of treating inflammation, pain, fever, allergies and thrombosis in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof wherein R^1 and R^2 are the same or different and each is hydrogen, hydroxy, halo, alkoxy of 1 to 4 carbon atoms or aralkyloxy of 1 to 4 carbon atoms in the alkyl moiety wherein the aryl moiety is phenyl; and X and Y are each hydrogen or nicotinoyl provided that at least one of R^1, R^2, X and Y is other than hydrogen, in combination with a pharmaceutically acceptable carrier.

4,593,026

ANTI-HYPOXIC DISUBSTITUTED POLYMETHYLENE IMINE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Gilbert Régnier, Malabry; Alain Dhainaut, Chatou; Michel Laubie, Vaucresson; Jacques Duhault, Croissy sur Seine, and Francois Roman, Courbevoie, all of France, assignors to Adir, S.A.R.L., Neuilly-sur-Seine, France

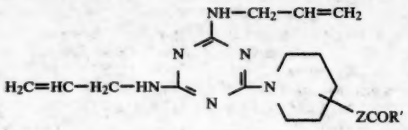
Continuation-in-part of Ser. No. 478,715, Mar. 25, 1983, Pat. No. 4,514,398. This application Apr. 6, 1984, Ser. No. 597,273

Claims priority, application France, Apr. 12, 1983, 83 05904

Int. Cl.[4] C07D *401/04, 403/04;* A61K *31/53*

U.S. Cl. 514—245 **5 Claims**

1. A compound selected from the group consisting of a disubstituted polymethylene imine of the formula I:



(I)

in which:

Z is oxygen and simultaneously

R′ is selected from the group consisting of: straight and branched hydrocarbon radicals having

1 to 6 carbon atoms inclusive, optionally containing an oxygen atom, optionally substituted by halophenyl; and phenyl and methylenedioxyphenyl radicals; and furyl, benzodioxanyl, and benzodioxinyl radicals; or

Z is NH and simultaneously

R′ is lower-alkyl having 1 to 6 carbon atoms inclusive; and a physiologically tolerable acid addition salt thereof.

5. A method for treating a living animal body afflicted with a tissular hypoxy, comprising the steps of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,593,027

3-ARYL-7-CHLORO-3,4-DIHYDROACRIDINE-1,9(2H,10H)-DIONE 1-OXIMES AND 1-HYDRAZONE DERIVATIVES, THEIR SALTS, A PROCESS FOR THEIR PREPARATION, AGENTS CONTAINING THEM AND THEIR USE

Erhardt Winklemann, Kelkheim; Walter Dürckheimer, Hattersheim am Main, and Wolfgang Raether, Dreieich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

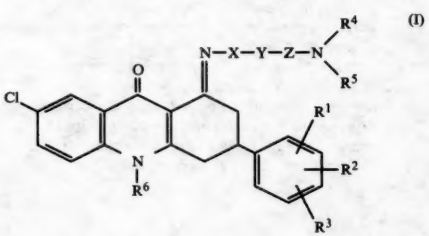
Filed Oct. 11, 1983, Ser. No. 540,647

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, 3237649; Dec. 24, 1982, 3247908

Int. Cl.[4] A61K *31/495, 31/435;* C07D *295/04, 471/00*

U.S. Cl. 514—253 **8 Claims**

1. 3-Aryl-7-chloro-3,4-dihydroacridine-1,9(2H,10H)-dione 1-oximes and 1-hydrazone compounds of the formula I



(I)

in which R^1 denotes hydrogen, halogen, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, trifluoromethoxy, difluorochloromethoxy, 1,1,2,2-tetrafluoroethoxy, phenoxy, halogenophenoxy, C_1–C_4-alkylthio, phenylthio, naphthylthio, C_1–C_4-alkylsulfinyl, phenylsulfinyl, naphthylsulfinyl, C_1–C_4-alkylsulfonyl, phenylsulfonyl, naphthylsulfonyl, trifluoromethylthio, carbamyl, sulfamyl, cyano or nitro,

R^2 represents hydrogen or halogen,

R^3 represents hydrogen,

(a) X denotes oxygen,

Y denotes a single bond and

Z denotes a straight-chain or branched alkylene chain having 2 to 5 carbon atoms which may be substituted with a hydroxy group, or

(b) X, Y and Z denote a single bond, or

(c) X denotes the —NR— group, in which R denotes hydrogen or C_1–C_4-alkyl,
Y denotes a single bond and
Z denotes a straight-chain or branched alkylene chain having 2 to 5 carbon atoms, or
(d) X denotes the —NR— group, in which R denotes hydrogen or C_1–C_4-alkyl,
Y denotes the carbonyl, thiocarbonyl or iminocarbonyl group and
Z denotes a single bond, or
(e) X denotes the —NR— group, in which R denotes hydrogen or C_1–C_4-alkyl,
Y denotes the carboxamido, thiocarboxamido or carboxamidino group and
Z denotes a straight-chain or branched alkylene chain having 2 to 5 carbon atoms, or
(f) X denotes the —NR— group, in which R denotes hydrogen or C_1–C_4-alkyl,
Y denotes the carbonyl group and
Z denotes a straight-chain or branched alkylene chain having 1 to 3 carbon atoms, or
(g) X denotes the —NR— group, in which R denotes hydrogen or C_1–C_4-alkyl,
Y denotes the carboxyl group and
Z denotes a straight-chain or branched alkylene chain having 2 to 5 carbon atoms, and
R^4 and R^5 together with the nitrogen atom, denote a piperazine ring which is unsubstituted on the nitrogen or substituted on the nitrogen by an alkyl group having 1 to 3 carbon atoms which may be substituted by a hydroxyl group, or by phenyl-C_1–C_3-alkyl or naphthyl-C_1–C_3-alkyl or by phenyl or naphthyl, which may be substituted by methyl, methoxy, chlorine or trifluoromethyl, and
R^6 denotes hydrogen or the hydroxyl group, their physiologically tolerated acid addition salts and their physiologically tolerated addition salts of (C_1–C_4)-alkyl or benzyl halides.

8. A method for combating plasmodia and/or coccidia comprising the step of administering a chemotherapeutically effective amount of a compound as claimed in claim **1** to a patient.

4,593,028

5-HETERO ARYL-SUBSTITUTED-2-PYRIDONES USEFUL AS CARDIOTONIC AGENTS FOR TREATMENT OF CONGESTIVE HEART FAILURE

Henry F. Campbell, Lansdale, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

PCT No. PCT/US83/00291, § 371 Date Apr. 19, 1984, § 102(e) Date Apr. 19, 1984
Continuation-in-part of Ser. No. 314,692, Oct. 26, 1981, Pat. No. 4,514,400. This PCT application Mar. 4, 1983, Ser. No. 619,388
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/505, 31/495;* **C07D** *239/02, 401/00*
U.S. Cl. 514—256 **1 Claim**

1. 1-Ethyl-5-(4-pyrimidinyl)-2-pyridone or a pharmaceutically acceptable salt thereof.

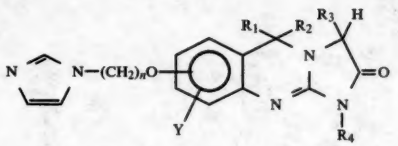
4,593,029

NOVEL ω-(N-IMIDAZOLYL)ALKYL ETHERS OF 1,2,3,5-TETRAHYDROIMIDAZO[2,1-B]QUINAZOLIN-2-ONES

Michael C. Venuti, San Francisco, and John J. Bruno, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 15, 1984, Ser. No. 580,411
Int. Cl.[4] A61K *31/505;* **C07D** *487/04*
U.S. Cl. 514—267 **147 Claims**

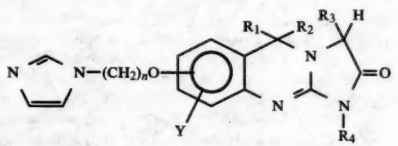
1. A compound of the formula



(I)

wherein:
n is an integer of 1 to 8;
R_1 is hydrogen or alkyl of 1–6 carbons;
R_2 is hydrogen;
R_3 is hydrogen, alkyl of 1–6 carbons, phenyl, benzyl, hydroxy lower alkyl, carbamoylalkyl, carboxyalkyl, alkoxycarbonylalkyl;
R_4 is hydrogen, alkyl of 1–6 carbons, benzyl, or hydroxy lower alkyl;
Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy;
any of its optical isomers, the mixture thereof, or a pharmaceutically acceptable acid addition salt.

144. A method for inhibiting 3',5'-cyclic AMP phosphodiesterase which method comprises administering a cyclic AMP phosphodiesterase inhibiting amount of a compound of the formula



(I)

wherein:
n is an integer of 1 to 8;
R_1 is hydrogen or alkyl of 1–6 carbons;
R_2 is hydrogen;
R_3 is hydrogen, alkyl of 1–6 carbons, phenyl, benzyl, hydroxy lower alkyl, carbamoylalkyl, carboxyalkyl, alkoxycarbonylalkyl;
R_4 is hydrogen, alkyl of 1–6 carbons, benzyl, or hydroxy lower alkyl;
Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy;
any of its optical isomers, the mixture thereof, or the pharmaceutically acceptable acid addition salt.

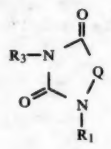
4,593,030

USE OF 6-ARYLURACILS AS ANTIINFLAMMATORY AND ANTIARTHRITIC AGENTS

Harvey I. Skulnick; Herman W. Smith; Robert J. Smith, and Wendell Wierenga, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 512,497, Jul. 11, 1983, Pat. No. 4,495,349. This application Sep. 17, 1984, Ser. No. 651,501
Int. Cl.[4] A61K *31/55, 31/505*
U.S. Cl. 514—269 **8 Claims**

1. A process for use as an antiinflammatory agent comprising the administration of a compound of the formula

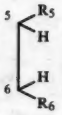


I

wherein R_1 and R_3 are the same and are hydrogen, alkyl of from 1 to 4 carbon atoms; inclusive, or benzyl;
Q is

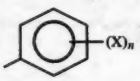
Q_1

or



Q_2

wherein R_5 is hydrogen or bromine with the proviso that R_5 is only hydrogen when Q is Q_2 and R_6 is selected from the group consisting of



III_6

wherein n is a number of from 0 to 3, inclusive; and
X is hydroxy, alkyl of from 1 to 8 carbon atoms, inclusive; alkoxy of from 1 to 5 carbon atoms, inclusive; alkylthio of from 1 to 5 carbon atoms, inclusive; halogen; $—NX_1X_2$; aminoalkyl of from 1 to 3 carbon atoms, inclusive; nitro; benzyl; aryl; furyl; pyridyl; or thiophene, and wherein X_1 and X_2 are the same or different and are alkyl of from 1 to 8 carbon atoms, inclusive; or taken together with —N are a saturated cycloalkylamino group

—NCn'

where n' is 3, 4, 5 or 6 or dialkyl substituted cycloalkylamino, wherein each alkyl is from 1 to 3 carbon atoms, inclusive with the proviso that R_6 does not include nitro; furyl; or thiophene when Q is Q_2; or a salt thereof in association with a pharmaceutical carrier to an animal, including man.

4,593,031

METHOD OF TREATING DEPRESSION

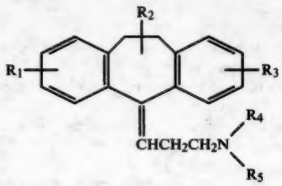
Robert W. Griffith, Basking Ridge, and Jack Singer, Short Hills, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 574,188, Jan. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 475,050, Mar. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 360,463, Mar. 22, 1982, abandoned. This application Jun. 5, 1985, Ser. No. 741,708

Int. Cl.[4] A61K *31/44, 31/135*

U.S. Cl. 514—288 **18 Claims**

1. An oral pharmaceutical composition useful in the treatment of depression or senile dementia with depression in humans comprising a compound of the formula



where
R_1, R_2 and R_3 are each independently hydrogen, chloro or bromo; and
R_4 and R_5 are each independently hydrogen, alkyl of 1 to 6 carbon atoms, benzyl or cycloalkyl of 3 to 8 carbon atoms, or
a pharmaceutically acceptable acid addition salt thereof and an essentially 1:1:1 by weight mixture of dihydroergocryptine (2:1α:β), dihydroergocornine and dihydroergocristine or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier therefor, said compound and said mixture being present in amounts sufficient to provide 10 to 150 milligrams of compound per day and 1 to 10 milligrams of mixture per day.

4,593,032

TERGURIDE AS ANTIHYPERTENSIVE

Wolfgang Kehr; Gertrud Schröder; Gunter Stock, and Helmut Wachtel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,064

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3410218

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—288 **8 Claims**

1. A method of achieving an antihypertensive effect in a patient comprising administering to a patient suffering from hypertension an antihypertensively effective amount of terguride or a pharmacologically acceptable acid salt thereof.

4,593,033

SUBSTITUTED INDENO[2,1-c]PYRIDINES USEFUL AS CALCIUM CHANNEL BLOCKERS

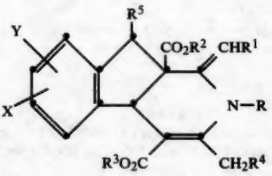
George D. Hartman, Lansdale; Wasyl Halczenko, Hatfield, and Steven D. Young, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rayway, N.J.

Filed Apr. 24, 1985, Ser. No. 726,746

Int. Cl.[4] A61K *31/435, 31/44;* **C07D** *221/16*

U.S. Cl. 514—290 **10 Claims**

1. A compound represented by the following general structural formula (I):



(I)

wherein:
R is hydrogen, C_1–C_8 alkyl or benzyl;
R^1 and R^4 independently are hydrogen, C_1–C_8 alkyl, C_2C_8 alkenyl, C_1–C_8 cycloalkyl, C_1–C_8 hydroxyalkyl;
R^2 and R^3 independently are C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_8 cycloalkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 dihydroxy-

alkyl, C_2–C_8 alkoxyalkyl, C_3–C_8 alkoxy(alkoxyalkyl), C_1–C_8 aminoalkyl wherein the amino group is NR^6R^7 in which R^6 and R^7 independently are hydrogen, C_1—C_8 alkyl, C_7–C_{14} phenylalkyl or R^6 and R^7 together with the N atom is piperidyl;

R^5 is hydrogen or C_1–C_8 alkyl; and

X and Y independently are hydrogen, C_1–C_8 alklyl, C_1–C_8 alkoxy, CF_3, cyano, nitro or halo, of a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition, useful in the treatment of cardiovascular disorders caused by high cellular concentration of calcium comprising a nontoxic amount of a compound according to claim 1 in an admixture with a pharmaceutically acceptable carrier wherein said amount is such that will therapeutically effectively reduce the cellular concentration of calcium.

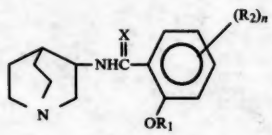
4,593,034

2-ALKOXY-N-(1-AZABICYCLO[2.2.2]OCT-3-YL)BENZAMIDES AND THIOBENZAMIDES

Harry R. Munson, Jr., and Robert F. Boswell, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Apr. 6, 1984, Ser. No. 597,275
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—305 **3 Claims**

1. A method for treating warm blooded animals for emesis caused by administration of platinum drugs during cancer treatment which comprises internally administering thereto an emesis inhibiting effective amount of a compound selected from the group consisting of 2-alkoxy-N-(1-azabicyclo[2.2.2]-oct-3-yl)benzamides and thiobenzamides of the formula:



wherein;

X is oxygen or sulphur

R_1 is loweralkyl containing up to eight carbons

R_2 is selected from the group consisting of hydrogen, halo, 4,5-benzo, alkoxy containing up to eight carbons or Am wherein Am is selected from amino, methylamino or dimethylamino,

n is 1 or 2,

and the pharmaceutically acceptable acid addition salts thereof.

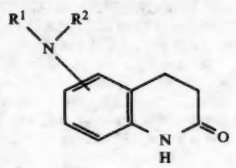
4,593,035

CARBOSTYRIL DERIVATIVES

Michiaki Tominaga; Hidenori Ogawa; Takafumi Fujioka; Yung-hsiung Yang, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company Limited, Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,632
Claims priority, application Japan, Dec. 14, 1983, 58-235863
Int. Cl.[4] A61K *31/47*; C07D *215/38*
U.S. Cl. 514—312 **17 Claims**

1. A carbostyril compound of the formula:



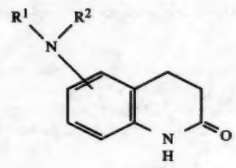
(I)

wherein R^1 is hydrogen atom or a lower alkyl group, R^2 is a lower alkyl group or a group of the formula:

R^3 is a lower alkylthio group, a lower alkyl group, a lower alkoxy group, phenoxy group, a phenyl(lower)alkoxy group, a lower alkenyloxy group, a phenyl group which may have a substituent selected from a lower alkoxy and a lower alkylenedioxy group on the phenyl ring, or a group of the formula: $—NR^4R^5$ (R^4 and R^5 are the same or different and are each hydrogen atom or a lower alkyl group), and X is oxygen atom or sulfur atom, provided that when R^1 is hydrogen atom and R^2 is the group of the formula:

X is not oxygen atom and R^3 is not a lower alkyl group, and a pharmaceutically acceptable salt thereof.

14. A method for the treatment of congestive heart failure, which comprises administering an effective amount of a carbostyril compound of the formula:



(I)

wherein R^1 is hydrogen atom or a lower alkyl group, R^2 is a lower alkyl group or a group of the formula:

R^3 is a lower alkylthio group, a lower alkyl group, a lower alkoxy group, phenoxy group, a phenyl(lower)alkoxy group, a lower alkenyloxy group, a phenyl group which may have a substituent selected from a lower alkoxy and a lower alkylenedioxy group on the phenyl ring, or a group of the formula: $—NR^4R^5$ (R^4 and R^5 are the same or different and are each hydrogen atom or a lower alkyl group), and X is oxygen atom or sulfur atom, provided that when R^1 is hydrogen atom and R^2 is the group of the formula:

X is not oxygen atom and R^3 is not a lower alkyl group, or a pharmaceutically acceptable salt thereof to patients suffering from congestive heart failure.

4,593,036

(−)-TRANS-4-(4-FLUOROPHENYL)-3-[(4-METHOXYPHENOXY)METHYL]-1-METHYLPIPERIDINE USEFUL AS 5-HT POTENTIATOR

Jorgen B. Lassen, Glostrup; Jorgen A. Christensen, Virum; Erling N. Petersen, Glostrup, and John B. Hansen, Lyngby, all of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

Filed Feb. 7, 1984, Ser. No. 577,845
Int. Cl.[4] C07D *211/22;* A61K *31/445*
U.S. Cl. 514—317 **8 Claims**

1. A compound selected from the group consisting of (−)-trans-4-(4-fluorophenyl)-3-[(4-methoxyphenoxy)methyl]-1-methylpiperidine and a pharmaceutically-acceptable acid addition salt thereof.

5. A method of potentiating the 5-HT of a subject in need thereof comprising the step of administering to the said subject an effective 5-HT potentiating amount of a compound of claim **1**.

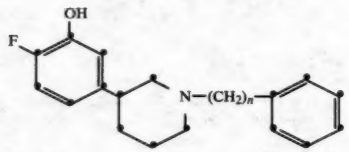
4,593,037

1,3-DISUBSTITUTED PIPERIDINE COMPOUNDS AS NEUROLEPTIC AGENTS

Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,910
Int. Cl.[4] C07D *211/22;* A61K *31/445*
U.S. Cl. 514—317 **7 Claims**

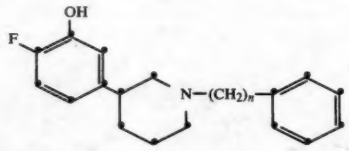
1. A 1,3-disubstituted piperidine compound of the formula



and the pharmaceutically-acceptable acid-addition salts thereof; wherein

n is an integer from 3 to 5.

4. A method of treating a psychotic disorder in a human subject in need of such treatment, which comprises administering to said subject an effective psychotic disorder treating amount of a 1,3-disubstituted piperidine compound of the formula



or a pharmaceutically-acceptable acid-addition salt thereof; wherein

n is an integer from 3 to 5.

4,593,038

TOPICAL USE OF 3-PHENYLACETYLAMINO-2,6-PIPERIDINEDIONE FOR TREATMENT OF SKIN WRINKLES AND HYPERPIGMENTATION

Stanislaw R. Burzynski, #5 Concord Cir., Houston, Tex. 77024

Filed Apr. 3, 1985, Ser. No. 719,522
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—328 **8 Claims**

1. A method of cosmetically treating skin to reduce wrinkles which comprises topically applying to affected skin areas a cosmetically effective amount of 3-phenylacetylamino-2,6-piperidinedione dispersed in a suitable cosmetic vehicle.

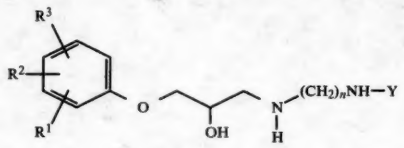
4,593,039

1-ARYLOXY-3-(SUBSTITUTED AMINOALKYLAMINO)-2-PROPANOLS

John J. Baldwin, Gwynedd Valley; Sandor L. Varga, Harleysville, and Gerald S. Ponticello, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

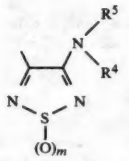
Filed Apr. 2, 1984, Ser. No. 596,200
Int. Cl.[4] C07D *285/10;* A61K *31/41*
U.S. Cl. 514—362 **17 Claims**

1. A compound having the structural formula:



or a pharmaceutically acceptable salt thereof, wherein:

Y is (1)



wherein m is 1 or 2,

n is 1–8;

R^1 is

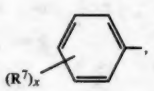
(1) hydrogen,
(2) hydroxy, or
(3) hydroxymethyl;

R^2 and R^3 are independently:

(1) hydrogen,
(2) halo,
(3) hydroxy,
(4) amino,
(5) di(C_{1-5}alkyl)amino,
(6) mono(C_{1-5}alkyl)amino,
(7) nitro,
(8) cyano,
(9) C_{1-6}alkyl,
(10) C_{3-8}cycloalkyl,
(11) C_{2-5}alkenyl,
(12) C_{1-4}alkoxy,
(13) C_{1-4}alkylthio,
(14) C_{2-5}alkenyloxy,
(15) C_{1-5}alkanoyl;

R^4 and R^5 are independently:

(1) hydrogen,
(2) C_{1-6}alkyl, either unsubstituted or substituted with:
  (a) hydroxy,
  (b) C_{1-4}alkoxy, or
(3)



wherein X is 0, 1 or 2;

R^4 and R^5 are joined together to form a 5 membered ring with the nitrogen to which they are attached,

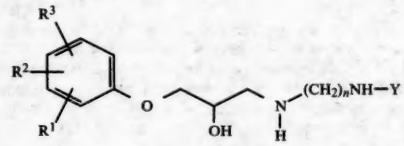
R^7 is

(1) C_{1-6}alkyl,

(2) C_{1-4}alkoxy,

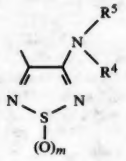
(3) or halo.

4. A pharmaceutical β-blocking composition comprising a pharmaceutically acceptable carrier and an effective β-blocking amount of a compound of formula:



or a pharmaceutically acceptable salt thereof, wherein:

Y is (1)



wherein m is 1 or 2,

n is 1–8;

R^1 is

(1) hydrogen,

(2) hydroxy, or

(3) hydroxymethyl;

R^2 and R^3 are independently:

(1) hydrogen,

(2) halo,

(3) hydroxy,

(4) amino,

(5) di(C_{1-5}alkyl)amino,

(6) mono(C_{1-5}alkyl)amino,

(7) nitro,

(8) cyano,

(9) C_{1-6}alkyl,

(10) C_{3-8}cycloalkyl,

(11) C_{2-5}alkenyl,

(12) C_{1-4}alkoxy,

(13) C_{1-4}alkylthio,

(14) C_{2-5}alkenyloxy,

(15) C_{1-5}alkanoyl;

R^4 and R^5 are independently:

(1) hydrogen,

(2) C_{1-6}alkyl, either unsubstituted or substituted with:

(a) hydroxy,

(b) C_{1-4}alkoxy, or

(c) phenyl;

(3)

wherein X is 0, 1 or 2;

R^4 and R^5 are joined together to form a 5 membered ring with the nitrogen to which they are attached,

R^7 is

(1) C_{1-6}alkyl,

(2) C_{1-4}alkoxy, or

(3) halo.

4,593,040

COMPOSITIONS FOR COMBATTING PHYTOPATHOGENICAL FUNGI AND BACTERIA EMPLOYING MIXTURES OF BENZYL PHENOL DERIVATIVES AND CARBENDAZIN

Lothar Adam, Kleinmachnow; Ursula Albrecht, Wilhelmshorst; Ulrich Burth, Kleinmachnow; Axel Kramer, Greifswald; Sieghard Lück, Teltow; Rainer Müller, Kleinmachnow; Lothar Neeb, Berlin; Hubert Rattba, Teltow, and Wolfgang Weuffen, Greifswald, all of German Democratic Rep., assignors to VEB Berlin-Chemie, Berlin, German Democratic Rep.

Filed Aug. 17, 1982, Ser. No. 408,582

Claims priority, application German Democratic Rep., Jun. 25, 1981, 2311483; Nov. 20, 1981, 2350192; Mar. 17, 1982, 2382263

Int. Cl.[4] A01N *31/08, 43/52*

U.S. Cl. 514—395 **3 Claims**

1. A mixture for controlling phytopathogenic fungi and bacteria, comprising 2-chloro-6-methyl-4-benzylphenol and carbendazim in a weight proportion in the range of 1:50 to 1:5.

4,593,041

BENZO-PYRONES AS A TREATMENT FOR SCHIZOPHRENIA

John R. Casley-Smith, 97 Seaview Rd., Tennyson, South Australia, Australia

Filed Mar. 14, 1985, Ser. No. 711,647

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—457 **4 Claims**

1. A method of treating high protein oedema, schizophrenia or disciform maculopathy in humans by daily administering orally to a human in need of such treatment from about 400 to about 3000 mg of a drug from the group consisting of courmarin and troxerutin.

4,593,042

BICYCLO-SUBSTITUTED PHENYLACETONITRILE DERIVATIVES

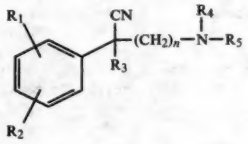
Chi-Dean Liang, Glenview, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Oct. 18, 1985, Ser. No. 789,255

Int. Cl.[4] A61K *31/275;* **C07C** *121/78*

U.S. Cl. 514—523 **10 Claims**

1. A compound of the formula



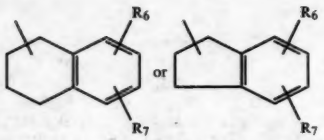
and the pharmaceutically acceptable salts and hydrates thereof wherein

R_1 and R_2 are the same or different and each is selected from hydrogen, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy or trifluoromethyl;

R_3 is selected from straight or branched chain (a) alkyl of from about 1 to 15 carbon atoms or (b) alkenyl of from about 2 to 15 carbon atoms;

R_4 is selected from hydrogen or C_{1-C4} alkyl;

R_5 is a bicyclic group selected from



wherein R_6 and R_7 are the same as defined above for R_1 and R_2; and

n is an integer from 2 to 4, inclusive.

7. A method of promoting a calcium ion antagonist or anti-hypertensive effect in a mammal in need thereof comprising administering thereto an effective amount of a compound according to claim 1.

4,593,043

MERCAPTO ACYL-CARNITINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Maria O. Tinti, Rome; Emma Quaresima, Casal Palocco; Carlo Bagolini, and Paolo DeWitt, both of Rome, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Mar. 19, 1982, Ser. No. 359,732

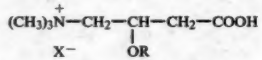
Claims priority, application Italy, Mar. 31, 1981, 48167 A/81

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/22, 31/23;* **C07C** *149/243*

U.S. Cl. 514—547 **11 Claims**

1. Mercapto acyl-carnitines of the general formula



(I)

wherein:

X^- is a pharmacologically acceptable halogenide ion, and

R is the mercapto acyl radical of a mercapto alkanoic acid having from 2 to 10 carbon atoms.

4,593,044

INJECTABLE SOLUTION FOR THE TREATMENT OF INFLAMMATIONS

Gunter Metz, Blaubeuren, Fed. Rep. of Germany, assignor to Merckle GmbH, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,333

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328401

Int. Cl.[4] A61K *31/19, 31/195, 31/13*

U.S. Cl. 514—557 **16 Claims**

1. An anti-inflammatory injectable solution consisting essentially of an effective amount of an anti-inflammatory active compound selected from the group consisting of naproxen, ketoprofen and diclofenac in the form of its lysinate and a pharmaceutically acceptable diluent, wherein said solution is stable and has a pH in the physiological range.

4,593,045

N-ACETYL-L-ASPARTYL TAURINE USEFUL AS HYPERTENSIVE AGENT

Michel Flork, Pontaumur, and Alphonse Bigou, Paris, both of France, assignors to Societe a Responsabilite Limite dite: B.F.B. Estudes et Recherches Experimentales, Paris, France

Continuation-in-part of Ser. No. 400,181, Jul. 20, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,506

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—562 **4 Claims**

1. A process for treatment of hypertension in human or animal patients, which comprises administering an effective amount of N-acetyl-L-aspartyl taurine.

4,593,046

METHOD OF REDUCING SKIN IRRITATION FROM BENZOYL PEROXIDE

Murray Gruber, 19 Laurel Dr., Great Neck, N.Y. 11021

Filed Jul. 15, 1983, Ser. No. 514,089

Int. Cl.[4] A61K *31/075*

U.S. Cl. 514—717 **2 Claims**

1. A process for reducing the skin irritation resulting from contact of the skin with benzoyl peroxide wherein the aloe vera gel and the benzoyl peroxide are admixed together prior to applying to the skin of a patient and wherein the admixture of aloe vera gel and benzoyl peroxide comprises at least about 20% wt. of benzoyl peroxide and at least about 0.1% of aloe vera gel.

4,593,047

PROCESS FOR THE PREPARATION OF 3-TRIFLUOROMETHYL-AND 2,5-DIMETHYL-4'-HDYROXY-α-ETHYL-BENZHYDROL, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Edit Tóth; József Tórley; György Fekete; László Szporny; László Vereczkey; Éva Palosi; Imre Klebovich; Pál Vittay; Sandor Görög, and István Hajdu, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Cyar RT, Budapest, Hungary

Filed Dec. 27, 1983, Ser. No. 565,835

Claims p•iority, application Hungary, Dec. 28, 1982, 4186/82

Int. Cl.[4] A61K *31/065*

U.S. Cl. 514—726 **3 Claims**

1. A method of treating acute ethanolic intoxication in an affected animal subject which comprises administering to the subject a pharmacologically effective amount of 3-trifluoromethyl-4'-hydroxy-α-ethylbenzhydrol.

4,593,048

BASE COMPOSITION FOR EXTERNAL PREPARATIONS, PHARMACEUTICAL COMPOSITION FOR EXTERNAL USE AND METHOD OF PROMOTING PERCUTANEOUS DRUG ABSORPTION

Susumu Sato; Umiko Takakura, and Mitsuru Tamada, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00385, § 371 Date May 13, 1983, § 102(e) Date May 13, 1983, PCT Pub. No. WO83/01000, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 24, 1982, Ser. No. 503,195

Claims priority, application Japan, Sep. 28, 1981, 56-154485

Int. Cl.[4] A61K *47/00*

U.S. Cl. 514—778 **7 Claims**

1. A composition which comprises a lower alcohol containing 1 to 4 carbon atoms and at least one adjuvant selected from the group consisting of (1) a saturated, acyclic, aliphatic hydrocarbon containing 6 to 16 carbon atoms, (2) a saturated cyclic, aliphatic hydrocarbon containing 6 to 12 carbon atoms, (3) a saturated, acyclic, halogenated, aliphatic hydrocarbon containing 6 to 16 carbon atoms, (4) a saturated, cyclic, halogenated, aliphatic hydrocarbon containing 6 to 12 carbon atoms, (5) an aliphatic carboxylic acid monohydric alcohol ester containing 19 to 24 carbon atoms in total wherein the carboxylic acid moiety is a fatty acid moiety containing 18 carbon atoms and the alcohol moiety contains 1 to 6 carbon atoms, and (6an acyclic ether containing 8 to 16 carbon atoms with one ether bonding per molecule, the amount of the adjuvant being 1 to 50 percent by weight based on the lower alcohol.

4,593,049

METHOD OF PRODUCING ELASTOMERIC SILICONE FOAM

Therese M. Bauman; Chi-Long Lee, and James A. Rabe, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 16, 1985, Ser. No. 787,857
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—99 15 Claims

1. A method of producing an elastomeric silicone foam consisting of

(A) mixing ingredients consisting essentially of

(1) a vinyl containing polydiorganosiloxane having at least an average of about 2 vinyl radicals per molecule, the organic radicals being selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms per radical, phenyl, and vinyl,

(2) a hydroxylated polydiorganosiloxane having an average of from greater than 1 to 2.5 silicon-bonded hydroxyl radicals per molecule and having an average of at least one organic radical per silicon atom selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms per radical and phenyl,

(3) a platinum catalyst in an amount sufficient to give from 5 to 200 parts by weight platinum per one million parts by weight total mixture,

(4) an organohydrogensiloxane having an average of at least 3 silicon-bonded hydrogen atoms per molecule, an average of no more than one silicon-bonded hydrogen atom per silicon atom and organic radicals selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms per radical and phenyl,

(5) a profoamer consisting essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{\frac{1}{2}}$ units and fluorine-containing units selected from the group consisting of $R_aR_b'SiO_{(4-a-b)/2}$ and $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R' is an alkyl radical containing from 1 to 3 carbon atoms, and R'' is a divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by means of a carbon or oxygen atom, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less with the provision that when R and R'' represent fluorine-containing units bonded to silicon via an oxygen atom the organosiloxane copolymer optionally contains repeating units of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxyl group per molecule and selected from the group consisting of polyethers, polyoxyalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than hydroxyl and $SiO_{4/2}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorine-containing units and any $GSiO_{3/2}$ units is sufficient to

(a) impart a surface tension of less than 2.2×10^{-4} newtons per centimeter at 25° C. to a 10 percent by weight solution of (5) in a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of 0.08 Pa.s at 25° C., and

(b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity and

(6) optionally, an amount of liquified blowing agent sufficient to form a foam following the release of a mixture containing said liquified blowing agent into an area under atmospheric pressure, the mixture containing this liquified blowing agent being confined under superatmospheric pressure, and

(7) optionally, an alcohol having from 1 to 12 carbon atoms, and

(8) optionally, flame retardant additives consisting essentially of non-flammable fibers and sulfur-free carbon black, there being sufficient organohydrogen present to provide a molar ratio of silicon-bonded hydrogen atoms to the sum of vinyl radicals, silicone-bonded hydroxyl radicals, and carbon bonded hydroxyl radicals of 0.5:1 to 40:1 the mixture having a viscosity of less than 100 Pa.s at 25° C., thereafter,

(B) allowing the mixture to form a froth and cure at ambient temperature to an elastomeric silicone foam.

4,593,050

ULTRAVIOLET LIGHT ASSISTED FLUORINATION OF POLYMER SURFACES

Robert E. Cohen, Jamaica Plain; George C. Corbin, Salem, and Raymond F. Baddour, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 25, 1983, Ser. No. 517,121
Int. Cl.[4] C08J 3/28
U.S. Cl. 522—2 8 Claims

1. The process for fluorinating a polymer to form a fluorinated polymer surface which comprises generating an ultraviolet light having a wave length of less than 400 nm and less than the absorption limit of the polymer in a first zone, contacting the surface of said polymer with a fluorinated gaseous species selected from the group consisting of fluorine, tetrafluoromethane, hydrogen fluoride, hexafluoroethane, sulfur hexafluoride, difluoromethane, trifluoromethane and mixtures thereof and a diluent gas in a second reactor zone, exposing said polymer to said ultraviolet light from said first zone under conditions to effect fluorination of the surface of said polymer at a temperature below the melting point of said polymer.

4,593,051

PHOTOCOPOLYMERIZABLE COMPOSITONS BASED ON EPOXY AND POLYMER/HYDROXYL-CONTAINING ORGANIC MATERIALS

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 7, 1983, Ser. No. 464,563
Int. Cl.[4] C08F 2/50; C08J 3/28
U.S. Cl. 522—31 23 Claims

1. A photocopolymerizable composition comprising:

(a) an epoxide containing two or more epoxy groups,

(b) a polymer-polyol dispersion prepared by the free radical polymerization of acrylonitrile or a mixture of acrylonitrile and styrene in an organic polyol, said polyol being a polyoxyalkylene polyol containing unsaturation, and

(c) at least one aromatic onium salt photoinitiator.

4,593,052

POLYMERIZABLE COMPOSITIONS CONTAINING DIPHENYLIODOSYL SALTS

Edward Irving, Burwell, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,990
Claims priority, application United Kingdom, Dec. 1, 1983, 8332073
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.[4] C08F 2/46, 2/48
U.S. Cl. 522—31 17 Claims

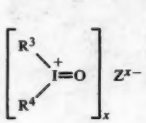
1. A polymerizable composition comprising

(A) a cationically polymerizable material,

(B) an epoxide-free organic hydroxy compound having at

least one alcoholic hydroxyl group and having a molecular weight of more than 500, which is a polyoxyalkylene glycol or triol, a polyepichlorohydrin, a hydroxyl-terminated polycaprolactone, a polymer of a hydroxyalkyl acrylate or a hydroxyalkyl methacrylate, a copolymer of allyl alcohol with a vinyl monomer, a polyvinyl alcohol, a hydroxypropylcellulose, a hydroxyl-containing polyvinyl acetal, a resin obtained by reacting an epoxide resin with an excess of a compound containing one or more groups reactive with epoxide groups, or a phenolic resol, and

(C) an aromatic iodosyl salt of formula



II

where

R^3 and R^4, which may be the same or different, each represent a monovalent aromatic radical having from 4 to 25 carbon atoms,

x denotes 1, 2 or 3, and

Z^{x-} denotes an x-valent anion of a protic acid.

4,593,053

HYDROPHILIC PRESSURE SENSITIVE BIOMEDICAL ADHESIVE COMPOSITION

Allan H. Jevne, Anoka; Brett R. Vegoe, Brooklyn Park; Carolann M. Holmblad, Cambridge, and Patrick T. Cahalan, Champlin, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 7, 1984, Ser. No. 679,653

Int. Cl.[4] A61K *9/70, 31/79*

U.S. Cl. 523—111 **11 Claims**

1. A skin-compatible, hydrophilic adhesive composition comprising:

25 to 50 weight percent polyvinyl pyrrolidone having a molecular weight in the range of 100,000 to 600,000;

2 to 5 weight percent polyvinyl alcohol having a molecular weight in the range of 150,000 to 300,000;

5 to 40 weight percent polar plasticizer;

3 to 50 weight percent water; and

about 0 to 50 weight percent of an ionic or nonionic species.

4,593,054

ADHESION PROMOTING AGENT, PROCESS FOR ITS PREPARATION AND USE THEREOF ON COLLAGENEOUS MATERIAL

Erik Asmussen, Farum, and Christian Munksgaard, Kokkedal, both of Denmark, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 664,117, Oct. 23, 1984. This application Aug. 12, 1985, Ser. No. 765,032

Claims priority, application Denmark, Oct. 25, 1983, 4898/83

Int. Cl.[4] C08K *5/07*

U.S. Cl. 523—118 **6 Claims**

1. In the adhesion of dental fillings and elements to substructures by applying an adhesion composition to the filling material and/or substructure and then a material to be adhered to the substructure, the improvement wherein the adhesive composition comprises an aliphatic aldehyde containing 1 to 20 carbon atoms and an ester of acrylic or methacrylic acid containing on —OH, $—NH_2$ or NH-moiety.

4,593,055

ERODIBLE SHIP-BOTTOM PAINTS FOR CONTROL OF MARINE FOULING

Melvin H. Gitlitz, Edison, and Howard H. Leiner, Cranbury, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 619,167, Jan. 17, 1984, which is a continuation-in-part of Ser. No. 458,377, Jan. 17, 1983, abandoned. This application Aug. 7, 1985, Ser. No. 763,376

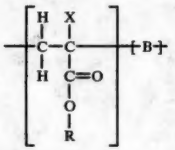
Int. Cl.[4] C08L *31/00, 31/02;* **C09D** *5/14*

U.S. Cl. 523—122 **19 Claims**

1. A antifouling paint for protecting marine surfaces, comprising in combination:

(a) toxicant and

(b) a film forming water insoluble, seawater erodible organotin free copolymer binder having recurring groups represented by the formula



wherein

X is H or CH_3;

R is a substantially non-bioactive, organosilyl moiety, and

B is the residue of an ethylenically unsaturated monomer.

4,593,056

EPOXY/AROMATIC AMINE RESIN SYSTEMS CONTAINING AROMATIC TRIHYDROXY COMPOUNDS AS CURE ACCELERATORS

Shahid P. Qureshi, Piscataway, and Hugh C. Gardner, Somerville, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 21, 1985, Ser. No. 747,189

Int. Cl.[4] C08G *59/68, 59/50*

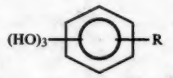
U.S. Cl. 523—445 **27 Claims**

1. A curable, thermosetting epoxy composition comprising:

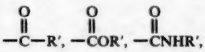
(a) an epoxy resin containing at least two 1,2-epoxy groups per molecule;

(b) an aromatic diamine hardener in an amount sufficient to provide from about 0.4 to about 2.0 equivalents of amine N—H per equivalent of 1,2-epoxy group in the epoxy resin; and

(c) an aromatic trihydroxy cure accelerator of the formula:



wherein R is hydrogen, aryl, alkyl,



SO_2R', or SO_2NHR', and R' is alkyl or aryl of from 1 to 12 carbon atoms, in an amount sufficient to provide from about 0.01 to about 0.35 equivalents of hydroxy per equivalent of 1,2-epoxy groups in the epoxy resin.

4,593,057

HINDERED PHENOLIC COMPOUNDS DERIVED FROM HEXITANS AND STABILIZED COMPOSITIONS

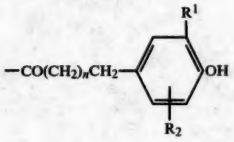
John F. Stephen, West Chester, Pa., and Jerry H. Smith, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Aug. 15, 1985, Ser. No. 765,679
Int. Cl.[4] C08K 5/15; C07D 307/24
U.S. Cl. 524—111 7 Claims

1. A hindered phenolic compound derived from a hexitan and having the general formula:

$C_6H_8O_5R_4$

where R has the following formula:



wherein R^1 and R^2 are independently hydrogen or alkyl groups of from 1 to 8 carbon atoms or cycloalkyl groups having from 5 to 12 carbon atoms; n has a value of 1 to 6, and $C_6H_8O_5$ is a hexitan structure.

5. A composition comprising a polymer derived from ethylenically unsaturated monomer and 0.005–5% by weight of a compound of claim 1.

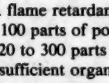
4,593,058

FLAME RETARDANT POLYPHENYLENE OXIDE THERMOPLASTICS

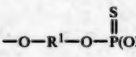
John J. Talley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,542
Int. Cl.[4] C08K 5/49, 5/51
U.S. Cl. 524—122 6 Claims

1. A flame retardant thermoplastic comprising by weight
(A) 100 parts of polyphenylene oxide,
(B) 20 to 300 parts of styrene resin and
(C) sufficient organothiophosphate of the formula



to provide from 0.5% to 5% by weight of phosphorus based on the weight of flame retardant thermoplastic where R is a $C_{(1-13)}$ monovalent hydrocarbon radical or substituted $C_{(1-13)}$ monovalent hydrocarbon radical, and Q is a monovalent group selected from the class consisting of —OR and



R^1 is selected from the class consisting of divalent $C_{(2-20)}$ hydrocarbon radicals, halogenated divalent $C_{(2-20)}$ hydrocarbon radicals and divalent radicals having the formula

$$-R^2(X)_aR^2-$$

where R^2 is a divalent $C_{(6-13)}$ arylene radical, X is a divalent radical selected from O, S, and C_yH_{2y}, y is a whole number from 1 to 5 inclusive and a is 0 or 1.

4,593,059

STABILIZERS FOR HALOGEN-CONTAINING ORGANIC POLYMERS COMPRISING AN ORGANOTIN MERCAPTIDE AND A DIALKYL ESTER OF AN UNSATURATED DICARBOXYLIC ACID

Keith A. Mesch, and Gary M. Conroy, both of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Nov. 20, 1984, Ser. No. 673,470
Int. Cl.[4] C08K 5/58
U.S. Cl. 524—181 50 Claims

1. A composition capable of stabilizing halogen-containing organic polymers against the deteriorative effects of heat, light and weathering, said composition comprising the product produced by combining:
A. an organotin compound or mixture of organotin compounds selected from the group consisting of organotin sulfides, organotin mercaptides and mixtures thereof; and
B. in an amount sufficient to synergize the stabilization of the halogen-containing organic polymer but insufficient to plasticize said polymer, a diester of an ethylenically unsaturated dicarboxylic acid having one carboxyl group on each carbon atom of the ethenylene group and 1 to 10 carbon atoms in the alcohol portion of the ester moieties.

4,593,060

SMOKE RETARDANT POLYVINYL HALIDE COMPOSITIONS

Manoj K. Gupta, and Gideon Salee, both of Williamsville, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 17, 1985, Ser. No. 724,141
Int. Cl.[4] C08K 5/09
U.S. Cl. 524—397 22 Claims

1. A smoke retardant polymer composition comprising a polymer consisting essentially of a polyvinyl halide resin and a smoke retardant proportion of calcium oxalate or a tin compound consisting essentially of tin oxalate.

4,593,061

STABILIZED POLY(ARYL ETHER KETONE) COMPOSITIONS

Christine E. Vogdes, Mountain View, and Brackin L. Andrews, San Carlos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 29, 1985, Ser. No. 717,344
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—417 20 Claims

1. A composition comprising an admixture of poly(aryl ether ketone) and a particulate molecular sieve selected from the group consisting of crystalline aluminosilicates, silicoaluminophosphates, and aluminophosphates in acid form or as a salt with a group IA or group IIA element in an amount effective to stabilize the poly(aryl ether ketone) against thermooxidative degradation.

4,593,062

DYNAMICALLY CURED THERMOPLASTIC OLEFIN POLYMERS

Robert C. Puydak, Cranbury, and Donald R. Hazelton, Chatam, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 10, 1984, Ser. No. 679,827
Int. Cl.[4] C08L 23/26, 9/00, 11/00
U.S. Cl. 524—426 31 Claims

1. A thermoplastic composition comprising a polymer blend wherein the polymer blend comprises a polyolefin resin, a halogenated butyl rubber and a polychloroprene rubber, said rubbers being co-vulcanized by dynamic vulcanization in the presence of the polyolefin resin.

4,593,063

HIGH GLOSS, IMPACT RESISTANT POLYMER RESINS FOR INJECTION MOLDING

Mary Ann Jones, and Charles B. Arends, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1985, Ser. No. 703,002
Int. Cl.[4] C08L *53/00*
U.S. Cl. 524—505 **32 Claims**

1. A method for producing a thermoplastic elastomer reinforced rigid resin blend which will yield a high gloss finish when injection molded comprising:

blending a rigid polymer with a thermoplastic elastomer;

controlling the morphology of the thermoplastic elastomer in the resin blend to ensure a laminar, network morphology in the elastomer phase of the blend, while maintaining the rigid polymer as the dominant, continuous phase of the blend.

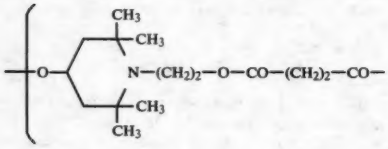
4,593,064

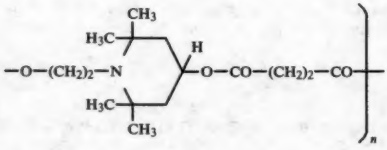
METHOD FOR POLYMERIZING METHYL METHACRYLATE

Ludwig Hosch, Michelstadt, Fed. Rep. of Germany, assignor to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 424,407, Sep. 22, 1982, Pat. No. 4,550,136, which is a continuation-in-part of Ser. No. 409,714, Aug. 19, 1982, abandoned, which is a continuation of Ser. No. 130,092, Mar. 13, 1980, abandoned. This application May 3, 1985, Ser. No. 730,048
Int. Cl.[4] C08F *120/14*; C08L *33/12*
U.S. Cl. 524—718 **2 Claims**

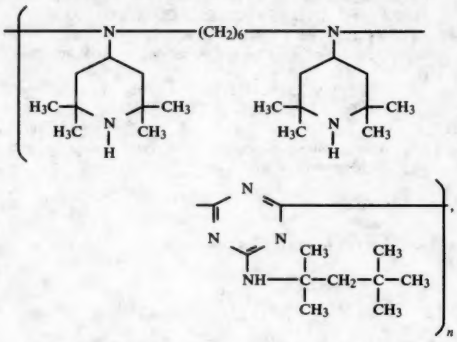
1. A method for making a methyl methacrylate polymer having high resistance to ultraviolet radiation and thermal damage, which method comprises polymerizing methyl methacrylate or a monomer mixture comprising at least 80 percent by weight of methyl methacrylate in the presence of a free radical-forming initiator and in the presence of 0.01 to 1 percent, by weight of the methyl methacrylate or monomer mixture, of a sterically hindered amine of the formula





where n is an integer such that the number average molecular weight of the amine is somewhat greater than 3000.

2. A method for making a methyl methacrylate polymer having high resistance to ultraviolet radiation and thermal damage, which method comprises polymerizing methyl methacrylate or a monomer mixture comprising at least 80 percent by weight of methyl methacrylate in the presence of a free radical-forming initiator and in the presence of 0.01 to 1 percent, by weight of the methyl methacrylate or monomer mixture, of a sterically hindered amine of the formula



wherein n is an integer such that the number average molecular weight of the amine is somewhat greater than 2500.

4,593,065

ORGANOPOLYSILOXANE COMPOSITION PAINTABLE AFTER ROOM TEMPERATURE CURING

Miyoji Fukayama, and Masayuki Onishi, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,141
Claims priority, application Japan, Aug. 16, 1984, 59-170865
Int. Cl.[4] C08L *83/04*
U.S. Cl. 524—860 **20 Claims**

1. An organopolysiloxane composition paintable after room temperature curing comprising a product obtained by mixing

(A) 100 parts by weight hydroxyl-group terminated organopolysiloxane having a viscosity at 25° C. of 0.02 to 1,000 Pa.s, the organic groups of said organopolysiloxane being monovalent groups selected from the group consisting of hydrocarbon groups, halogenated hydrocarbon groups and cyanoalkyl groups,

(B) a paintability compound which is an organosilicon compound possessing in each molecule at least one group with the general formula $X—R^1—O—$ directly bonded to a silicon atom, also possessing in each molecule at least one aminoxy or amido group directly bonded to a silicon atom, any remaining valences of silicon atoms in each molecule not satisfied by $X—R^1—O—$, aminoxy, and amido are satisfied by divalent oxygen atoms linking silicon atoms together or by monovalent groups selected from the group consisting of hydrocarbon groups, halogenated hydrocarbon groups, and cyanoalkyl groups, in the formula $X—R^1—O—$, X is selected from the group consisting of

where R^1 is a divalent hydrocarbon group, R^3 is a monovalent hydrocarbon group, R^2 is a monovalent hydrocarbon group or a hydrogen atom, (B) being present in a quantity such that there is from 0.01 to 10 parts by weight X groups per 100 parts by weight of (A),

(C) sufficient crosslinking compound necessary to cure this composition, said crosslinking compound being a silicon compound possessing in each molecule at least two groups directly bonded to silicon atoms selected from the group consisting of aminoxy groups and amido groups, any remaining valences of silicon atoms not satisfied by aminoxy and amido are satisfied by divalent oxygen atoms linking silicon atoms together, by monovalent groups selected from the group consisting of hydrocarbon

groups, halogenated hydrocarbon groups, and cyanoalkyl groups, and by X—R^1—O— groups; when X—R^1—O— groups are present one compound can function both as (B) and (C) provided there is a total of at least two aminoxy and amido groups per molecule.

4,593,066

IMPACT RESISTANT POLYAMIDE MOLDING COMPOSITIONS

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 6, 1984, Ser. No. 637,987
Int. Cl.[4] C08L *51/00*; C08F *8/30*
U.S. Cl. 525—66 **20 Claims**

1. A moldable composition comprising a polyamide resin and an elastomer having pendant allylic, benzylic or conjugated unsaturation at levels within the range of from about 1 to about 20 weight percent and grafted with from about 40 to about 60 weight percent of a polymer comprised of recurring units of, in weight percent, (A) from about 60 to about 95 vinyl aromatic monomer, (B) from about 5 to about 40 of at least one acid selected from the group consisting of acrylic acid, methacrylic acid, partially neutrlized acrylic acid, partially neutralized methacrylic acid, totally neutralized acrylic acid and totally neutralized methacrylic acid and (C) 0 to about 15 acrylate monomer, wherein said polymer which is grafted to the elastomer is thermodynamically miscible with the polyamide resin.

4,593,067

LOW SHRINKABLE UNSATURATED POLYESTER RESIN COMPOSITION

Masaharu Nakayama, Nagoya; Kyosuke Fukushi, Kuwana; Yasuo Moriya, and Nobuyoshi Suzuki, both of Chita, all of Japan, assignors to Nippon Oil and Fats Co., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,145
Claims priority, application Japan, Dec. 28, 1983, 58-248289
Int. Cl.[4] C08L *67/06*
U.S. Cl. 525—92 **8 Claims**

1. A low shrinkable unsaturated polyester resin composition consisting of:

(A) 20–70% by weight of an unsaturated polyester;

(B) 28–60% by weight of a monomer polymerizable with the above unsaturated polyester;

(C) 2–20% by weight of a block copolymer mixture, in which a mixture of the monomer (B) and the block copolymer mixture (C) is in a non-aqueous dispersion state, and a mixture of the polyester (A), the monomer (B) and the block copolymer mixture (C) is in a non-aqueous dispersion state, said block copolymer mixture is obtained by polymerizing either one of the monomers defined below in (a) and (b), with a polymerization initiator comprising a polymeric peroxide represented by the formula:

(I)

in which R_1 represents a divalent branched hydrocarbon group having 10–30 carbons, and R_2 and R_3 represent a hydrogen atom, a hydroxyl group or an alkali metal, and the average polymerization degree n is 2–40, to obtain a first polymer having peroxy bonds in its molecule, and block-polymerizing the first polymer with the remaining monomer (a) or (b), which was not been used in the first polymerization reaction, wherein

(a) is a monomer or a monomer mixture consisting of 70–100% by weight of styrene monomer and 0–30% by weight of a monomer polymerizable therewith;

(b) is a monomer or a mixture of monomers consisting of 70–100% by weight of C_{1-4} alkyl ester of acrylic acid or methacrylic acid and up to 30% by weight of a monomer polyermizable therewith selected from the group consisting of C_{5-18} alkyl ester of acrylic acid and methacrylic acid, acrylic acid, and methacrylic acid.

4,593,068

CURING COMPOSITION CONTAINING POLYETHER HAVING REACTIVE SILICON-CONTAINING GROUP AND A (METH)ACRYLATE POLYMER

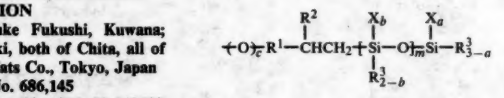
Toshifumi Hirose, and Katsuhiko Isayama, both of Kobe, Japan, assignors to Kanegafushi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 18, 1983, Ser. No. 542,995
Claims priority, application Japan, Oct. 20, 1982, 57-185277
Int. Cl.[4] C08L *33/08, 33/10, 71/02*
U.S. Cl. 525—100 **7 Claims**

1. A curing composition which comprises (A) a polyether having at least one reactive silicon-containing group in the molecule, wherein the main chain of the polyether consists of chemically linked recurring units represented by the general formula:

$$-R^4O-$$

wherein R^4 is a bivalent hydrocarbon group having 1 to 8 carbon atoms, the reactive silicon-containing group is a group represented by the general formula:



wherein R^1 is a bivalent organic group having 1 to 20 carbon atoms, R^2 is hydrogen or a monovalent organic group having 1 to 20 carbon atoms, R^3 is a monovalent hydrocarbon group having 1 to 20 carbon atoms, or a triorganosiloxy group represented by the formula: $(R')_3SiO$— wherein R' is a monovalent hydrocarbon group having 1 to 20 carbon atoms, a is 0, 1, 2 or 3, b is 0, 1 or 2, c is 0 or 1, provided that $1 \leqq a+b \leqq 4$, X is hydroxyl group or a hydrolyzable group, and m is 0 or an integer of 1 to 18, and (B) a polymer selected from the group consisting of an acrylate polymer, a methacrylate polymer and an admixture thereof, wherein the polymer is prepared from a monomeric mixture containing at least 50% by weight of an alkyl acrylate monomer or an alkyl methacrylate monomer, in which said alkyl group has 2 to 14 carbon atoms.

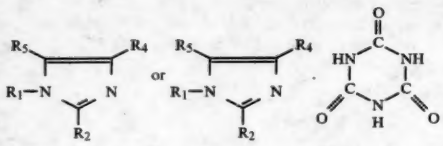
4,593,069

EPOXY RESIN COMPOSITION

Kazuo Kamagata, Hatoyama; Toshiaki Yamada; Shunichi Kawata, both of Tsurugashima, and Takashi Mizui, Kawagoe, all of Japan, assignors to Shikoku Chemicals Corp., Kagawa and Shikoku Finechemicals Corp., Tokyo, both of, Japan

Filed Jun. 21, 1985, Ser. No. 747,234
Claims priority, application Japan, Jun. 23, 1984, 59-129457; Jun. 27, 1984, 59-133559; Jun. 27, 1984, 59-133560
Int. Cl.[4] C08G *59/56*
U.S. Cl. 525—113 **7 Claims**

1. An epoxy resin composition comprising an epoxy resin, either 2-vinyl-4,6-diamino-s-triazine or 2-vinyl-4,6-diamino-s-triazine/isocyanuric acid adduct, and at least one compound selected from the group consisting of dicyandiamide, polyvinyl-p-phenol, and imidazole compounds represented by the following formula



wherein R_1 represents a hydrogen atom or a cyanoethyl group or 4,6-diaminotriazinyl(-2')ethyl group, R_2 represents a methyl, ethyl, undecyl, heptadecyl or phenyl group, R_4 represents a hydrogen atom or a methyl, hydroxymethyl, benzyl or 2-ethyl-5-methylimidazolyl(-4)-methyl group, and R_5 represents a hydrogen atom or a methyl or hydroxymethyl group.

4,593,070

IMPACT-RESISTANT PHENOLIC RESIN COMPOSITION

Motofumi Oyama, Yokosuka, and Yoichiro Kubo, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,148
Claims priority, application Japan, Mar. 1, 1984, 59-39618
Int. Cl.[4] C08L *61/10*
U.S. Cl. 525—139 **7 Claims**

1. An impact-resistant phenolic resin composition comprising 99 to 25% by weight of a thermosetting phenolic resin and 1 to 75% by weight of a nitrile group-containing highly saturated polymer rubber whose amount of bound nitrile ranges from 10 to 60% by weight and having an iodine value not exceeding 120.

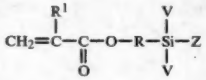
4,593,071

WATER-CURABLE, SILANE MODIFIED ETHYLENE POLYMERS

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 534,354, Sep. 23, 1983, Pat. No. 4,526,930. This application Nov. 9, 1984, Ser. No. 669,756
Int. Cl.[4] C08F *255/00, 255/02*
U.S. Cl. 525—288 **20 Claims**

1. A linear, low density ethylene-C_3 to C_8 alpha monoolefin polymer having a density of 0.850 to 0.930 having grafted thereto a silane of the formula:



wherein R^1 is hydrogen or methyl, R is a hydrocarbon radical, each V is hydrogen, a hydrocarbon radical or a hydrolyzable group and Z is a hydrolyzable group.

4,593,072

RELATIVELY WATER-STABLE COMPOSITIONS BASED ON THERMOPLASTIC POLYMERS CONTAINING PENDANT SILANE MOIETIES

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 534,354, Sep. 23, 1983, Pat. No. 4,526,930. This application Nov. 9, 1984, Ser. No. 669,755
Int. Cl.[4] C08L *43/04, 51/06*
U.S. Cl. 525—326.5 **6 Claims**

1. A relatively water-stable composition comprising a water-curable thermoplastic polymer having hydrolyzable, pendant moieties of the formula:

wherein R is methyl, ethyl or propyl and each V is a hydrocarbon radical having 1 to 18 carbon atoms inclusive or -(-OR) wherein R is as previously defined; at least a stoichiometric amount of a primary monohydric alcohol having at least 4 carbon atoms or a secondary monohydric alcohol having at least 3 carbon atoms; and an organo titanate esterification catalyst.

4,593,073

POLYMER RESINS WITH AMINO ACID CONTAINING PENDANTS FOR SORPTION OF BILE PIGMENTS AND BILE ACIDS

Leon E. St-Pierre, Frelighsburg; G. Ronald Brown, Dollard des Ormeaux; Dominique S. Henning, St-Hubert, and Marlene Bouvier, Montreal, all of Canada, assignors to The Royal Institution for the Advancement of Learing (McGill Univ.), Canada

Filed Apr. 23, 1985, Ser. No. 726,312
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—328.4 **20 Claims**

1. A polymer addition product comprising a hydrophilic polymer backbone having a molecular weight of at least about 5,000 and to which are chemically bonded amino acid containing pendants, said pendants containing at least one arginine or lysine amino acid in deprotected form.

4,593,074

ELASTOMER HAVING RANDOM PEROXIDE FUNCTIONALITY AND METHOD

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 14, 1984, Ser. No. 589,368
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—331.7 **16 Claims**

1. A method for generating random dialkyl or alkyl aryl peroxide functionality on an elastomer which comprises forming a solution of a solvent and an elastomer having pendant alkylic, benzylic or conjugated unsaturation at levels within the range of from about 1 to about 20 weight percent, and reacting the resulting solution with an alkyl or aryl hydroperoxide in the presence of a Group VIIa, VIII, Ib or IIb metal catalysts, wherein said elastomer is selected from the group consisting of butyl rubber and an olefin/α-olefin/non-conjugated diene terpolymer with the proviso that the olefin/α-olefin/non-conjugated diene terpolymer cannot be ethylene/-propylene/ethylidene norbornene.

4,593,075

PREPARATION OF ELASTOMERIC, CHLORINATED ETHYLENE POLYMERS

Mahmoud R. Rifi, Kendall Park, N.J., assignor to Union Carbide Corporation, Danbury CT

Continuation-in-part of Ser. No. 514,337, Jul. 15, 1983, abandoned. This application May 14, 1984, Ser. No. 608,875
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—356 **5 Claims**

1. A process which comprises reacting, at a temperature of about 50° C. to about 130° C. and for a period of about 3 to about 10 hours, an ethylene-butene-1 copolymer having a density of about 0.875 to about 0.918 and a pore volume of about 0.1 to about 1 cc per gram with a gaseous chlorinating agent to produce an elastomeric, granular, chlorinated polymer having a tensile modulus of less than about 2,000 psi and a crystallinity of less than about 10 percent.

4,593,076

POLYMER OF CAPROLACTAM CONTAINING ELASTOMERIC COPOLYESTERAMIDE HAVING HIGH IMPACT STRENGTH

Saverio Russo, Genua; Giovanni C. Alfonso, Serravalle; Antonio Turturro, and Enrico Pedemonte, both of Genua, all of Italy, assignors to ENICHIMICA, S.p.A., Palermo, Italy

Filed Dec. 3, 1984, Ser. No. 677,231

Claims priority, application Italy, Dec. 5, 1983, 24022 A/83

Int. Cl.[4] C08L *67/00*

U.S. Cl. 525—425 6 Claims

1. A process for preparing a polymer of caprolactam containing a rubbery phase consisting of an elastomeric copolyesteramide homogeneously distributed within the polymer at the content within the range from 5 to 20% by weight, in which the copolyesteramide consists of a plurality of elastic molecular sequences alternating with rigid molecular sequences linked to each other by ester bonds, said process comprising:

(a) dissolving the copolyesteramide elastomer in all or a portion of the caprolactam monomer to form a solution, and

(b) polymerizing said solution of copolyesteramide elastomer and the balance of any undissolved caprolactam monomer in the presence of a basic initiator and a polymerization activator.

4,593,077

PROCESS OF MAKING A HIGH MELT VISCOSITY BLOCK COPOLYESTER

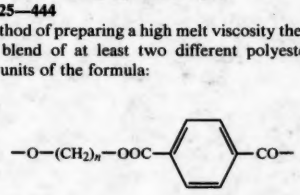
Willem F. H. Borman, Evansville, Ind.; Donald I. Craft, and Morton Kramer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 215,020, Dec. 10, 1980, abandoned, which is a continuation of Ser. No. 803,966, Jun. 6, 1977, abandoned, which is a continuation of Ser. No. 564,128, Apr. 1, 1975, Pat. No. 4,069,278. This application Mar. 20, 1985, Ser. No. 714,057

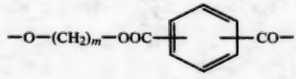
Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—444 2 Claims

1. A method of preparing a high melt viscosity thermoplastic polyester blend of at least two different polyesters having repeating units of the formula:



or



wherein n and m are positive integers between 1 and 10; said method consisting essentially of melt blending at least two low to medium melt viscosity linear polyesters selected from the group consisting of polyethylene terephalate, polybutylene, terephthalate, poly(ethylene isophthalate) and poly(1,4,-butylene isophthalate) and thereafter subjecting the melt blended polyesters to a temperature of 10°–50 ° C. below the melting point of the lowest melting ingredient in the blend in the presence of an inert atmosphere that contains a minor amount of alkylene glycol vapor until the melt viscosity has increased to at least 10,000 poises at a temperature 10°–15° C. above the melting point of the blend.

4,593,078

POLYGLYCIDYL ETHERS, THEIR PREPARATION AND THEIR USE IN PREPARING THERMOSETTING COATING COMPOSITIONS

Petrus G. Kooymans; Stephen A. Stachowiak; Jurrianus Bekooij, and Werner T. Raudenbusch, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 14, 1984, Ser. No. 609,610

Claims priority, application United Kingdom, Jun. 3, 1983, 8315230

Int. Cl.[4] C08L *63/04*

U.S. Cl. 525—497 6 Claims

1. A process for the preparation of a thermosetting resin coating composition suitable for electrodeposition which comprises (A) reacting (1) a polyglycidyl ether having, on average, n epoxy groups per molecule, where $1<n\leqq 2$, prepared by reacting a multifunctional glycidyl novolac resin having, on average, x epoxy groups per molecule, where $x>2$, with $(x-n)$ moles of a monofunctional alkyl-substituted phenol at a temperature of from about 120° to about 180° C. in the presence of an acid or base catalyst, with (2) an amino compound containing, on average, two amino-hydrogens per molecule or an alkali metal salt of an amino acid in aqueous medium at a temperature from about 100° to about 120° C., and then (B) combining the resultant resinous compounds wih a water soluble cross-linking compound in a weight ratio of from bout 95:5 to about 65:35, before or after neutralization.

4,593,079

RESIN RHEOLOGY CONTROL PROCESS AND CATALYST THEREFOR

Louis J. Rekers, Wyoming, and Stanley J. Katzen, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 217,483, Dec. 17, 1980, abandoned, which is a continuation of Ser. No. 957,601, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,586, May 25, 1977, abandoned. This application Jun. 1, 1982, Ser. No. 383,650

Int. Cl.[4] C08F *4/24*

U.S. Cl. 526—100 2 Claims

1. A process for the production of polyolefin resins comprising polymerizing at least one 1-olefin at elevated temperature and pressure in a polymerization zone comprising a catalytic amount of a polymerization catalyst for said 1-olefin, said catalyst comprising porous inorganic oxide support coated with an organophosphoryl chromium reaction product and an aluminum compound component and heat activated said aluminum compound component being hydrolyzed by reaction with a controlled amount of water.

4,593,080

SUPERIOR SOLVENT BLENDS FOR SYNTHESIS OF ACRYLIC RESINS FOR HIGH SOLIDS COATINGS

Constantine J. Bouboulis, Union, and Irving Kuntz, Linden, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 393,080, Jun. 28, 1982, Pat. No. 4,501,868. This application Oct. 24, 1984, Ser. No. 664,334

Int. Cl.[4] C08F *2/06, 220/20*

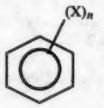
U.S. Cl. 526—208 10 Claims

1. A polymerizable composition, comprising:

(1) a monomer mixture comprising from about 5 to 30 wt. %, based on said monomer mixture, of at least one hydroxy-substituted alkyl (meth)acrylate monomer and from about 5 to 95 wt. %, based on said monomer mixture, of at least one non-hydroxy-substituted alkyly (meth)acrylant monomer, said hydroxysubstituted and non-hydroxy-substituted alkyl (meth)acrylate monomers together comprising at least about 60 wt. % of said monomer mixutre; and

(2) a solvent blend comprising from from about 35 to 80 wt. %, based on said solvent blend, of methyl isobutyl ketone

and, as the balance thereof, at least one alkyl-substituted benzene solvent comprising at least one aromatic compound of the formula:



wherein n is an integer of from 1 to 4, and X is in each instance in which it appears independently selected from the group consisting of straight and branched-chain alkyl of from 1 to 4 carbon atoms, with the proviso that when n is 1, the X groups must contain a total of at least 2 carbon atoms and with the further proviso that when n is 2 or higher, the X groups must contain a total of a least 3 carbon atoms, and mixtures of the foregoing aromatic compounds.

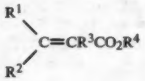
4,593,081

CHAIN-TRANSFER AGENTS FOR EMULSION POLYMERIZATION AND POLYMER PRODUCTS PRODUCED THEREWITH

Rex L. Bobsein, and Merlin R. Lindstrom, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 25, 1985, Ser. No. 727,155
Int. Cl.[4] C08F *2/38*
U.S. Cl. 526—211 **16 Claims**

1. An emulsion polymerization process which comprises polymerizing in aqueous medium under polymerization conditions at least one acrylic monomer having the formula:



wherein R', R^2, R^3, and R^4 are each independently selected from hydrogen and carbon containing radicals having 1–20 carbon atoms, in the presence of:

(i) a water soluble free-radical initiator,

(ii) an emulsifier, and

(iii) at least one chain-transfer agent selected from the group consisting of compounds having the formula:

$$HS—CH_2CH_2CO_2R$$

wherein R is a carbon containing radical having 1–20 carbon atoms, 6-mercaptomethyl-2-methyl-2-octanol, and 2-phenyl-1-mercapto-2-ethanol.

4,593,082

PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT VINYL COPOLYMERS

John R. Dombroski, and Waylon L. Jenkins, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1985, Ser. No. 759,196
Int. Cl.[4] C08F *2/24*
U.S. Cl. 526—216 **8 Claims**

1. The method of producing a high molecular weight copolymer from vinylpyridine and styrene monomers having greater than 50 mole % repeating units from vinylpyridine by emulsion polymerization which comprises

(a) combining said monomers with about 2.5–5%, based on the weight of the monomers, of a surfactant selected from the group consisting of alkali salts of unsaturated fatty acids having 12 to 24 carbon atoms and alkyl sulfates in which the alkyl group has 8 to 20 carbon atoms, and about 0.1–3%, based on the weight of monomers, of a polymerization initiator, in an aqueous medium at a solids level of about 5–50% by weight,

(b) carrying out said emulsion polymerization at a pH of about 10–14 at a temperature of about 40°–90° C. to produce polymer with an I.V. greater than 1.0, and

(c) isolating the polymer.

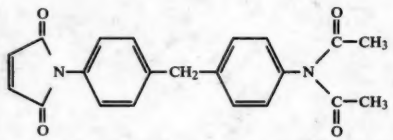
4,593,083

CURABLE COMPOSITION COMPRISING BISMALEIMIDE AND MALEIMIDE-AMIDE

Horst D. Stenzenberger, Schriesheim, Fed. Rep. of Germany, assignor to The Boots Company PLC, England

Filed Jul. 13, 1984, Ser. No. 630,664
Int. Cl.[4] C08F *22/40*
U.S. Cl. 526—262 **30 Claims**

1. Curable bisimide resin composition comprising 4,4'-bismaleimidodiphenylmethane and from 1 to 20% by weight of the weight of the 4,4'-bismaleimidodiphenylmethane of a compound of formula I



I

4,593,084

PLATINUM-PHOSPHINE-VINYLSILOXANE COMPLEXES

Grish Chandra, and Peter Y. K. Lo, both of Midland, Mich., assignors to Doe Corning Corporation, Midland, Mich.

Filed Nov. 19, 1984, Ser. No. 672,561
Int. Cl.[4] C08G *77/06*; C07F *15/00*
U.S. Cl. 528—15 **33 Claims**

1. A method for making platinum-phosphine complexes, said method comprising contacting approximately stoichiometric amounts of a platinum-vinylsiloxane complex and a phosphine selected from the group consisting of R_3P molecules and $R_2P(CH_2)_mPR_2$ molecules wherein each R is selected from the group consisting of monovalent hydrocarbon radicals free of aliphatic unsaturation and m has a value of 1, 2, or 3, said contacting being accomplished at room temperature or above in a substantially oxygen-free environment.

16. A curable silicone composition comprising

(1) from 1 to 99 parts of a silicone polymer having at least one unit selected from the group consisting of CH_2=CHSi≡ units and HOSi≡ units;

(2) from 1 to 99 parts of a silicone polymer having at least on HSi≡ unit; and

(3) a catalytically effective amount of a platinum complex having the general formula

T_aPtQ_b, wherein, in said general formula

T is a phosphine selected from the group consisting of phosphines having the formula R_3P and phosphines having the formula $R_2P(CH_2)_mPR_2$, each R being a monovalent hydrocarbon radical free of aliphatic unsaturation and m having a value of 1, 2, or 3;

a has a value of 1 or 2;

Q is a vinylsiloxane; and

b has a value of 1 or 2.

the above parts being parts by weight.

4,593,085

ALKOXY-FUNCTIONAL ONE COMPONENT RTV SILICONE RUBBER COMPOSITIONS

Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 449,105, Dec. 13, 1982, abandoned. This application Jul. 16, 1985, Ser. No. 755,954

Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—18 11 Claims

1. A one-component RTV silicone rubber composition comprising a base diorganopolysiloxane polymer having a viscosity in the range of 100 to 1,000,000 centipoise at 25° C. having one alkoxy group on each terminal silicon atom in the polymer chain and having at least one hydrolyzable leaving group on each terminal silicon atom in the polymer chain wherein the hydrolyzable leaving group is selected from the group consisting of silazy, cyclic amido, amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido radicals and the organo groups are C_{1-13} monovalent hydrocarbon radicals; an effective amount of a condensation catalyst; and a stabilizing amount of scavenger for hydroxy functional groups.

4,593,086

PREPARATION OF AROMATIC KETONE-SULFONE COPOLYMERS

Viktors Jansons, Los Gatos, and Heinrich C. Gors, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 594,503, Mar. 29, 1984, which is a continuation-in-part of Ser. No. 481,083, Mar. 31, 1983, abandoned, and a continuation-in-part of Ser. No. 648,119, Sep. 6, 1984, abandoned. This application Oct. 11, 1984, Ser. No. 659,742

Int. Cl.[4] C08G *75/23*

U.S. Cl. 528—173 8 Claims

1. A process for producing an aromatic polymer having ketone and sulfone groups comprising polymerizing a monomer system selected from the group consisting of

(I) at least one self polymerizing monomer having a carboxylic acid halide group and an aromatic hydrogen activated towards electrophilic substitution and at least one self polymerizing monomer having a sulfonic acid halide group and an aromatic hydrogen activated towards electrophilic substitution;

(II) at least one aromatic dicarboxylic acid dihalide and at least one aromatic disulfonic acid dihalide together with a substantially stoichiometric amount of at least one aromatic compound having two hydrogens activated towards electrophilic substitution; and

(III) combinations of the above; in a reaction medium comprising

(A) a Lewis base in an amount from 0.01 to 4 equivalents per equivalent of acid halide groups present in the monomer system;

(B) a Lewis acid in an amount of about one equivalent per equivalent of carbonyl groups present plus one equivalent per equivalent of Lewis base, plus an amount effective to act as a catalyst for the polymerization; and

(C) a non-protic diluent in an amount from 0 to 93 percent by weight, based on the weight of the total reaction mixture,

subject to the proviso that the molar ratio of carboxylic acid halide groups to sulfonic acid halide groups in the monomers is at least about 3.

4,593,087

DISPERSE AND ACID AZO DYES HAVING ONE OR TWO CINNAMOYL SUBSTITUENTS ON A THIAZOLE, ISOTHIAZOLE OR THIADIAZOLE DIAZONIUM MOIETY AND HAVING AN ANILINE, TETRAHYDROQUINOLINE OR BENZOMORPHOLINE COUPLER

Robert N. Gourley, Merseyside, England, assignor to Eastman Kodak Company, Rochester, N.Y.

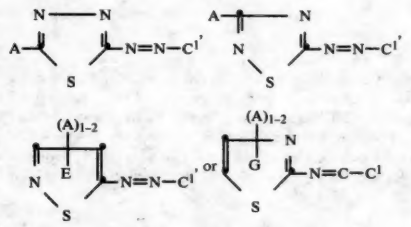
Filed Jan. 23, 1984, Ser. No. 573,253

Claims priority, application United Kingdom, Oct. 7, 1983, 8326867

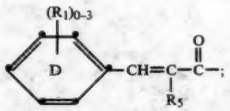
Int. Cl.[4] C09B *29/039, 29/042, 29/048;* D06P *1/02*

U.S. Cl. 534—784 8 Claims

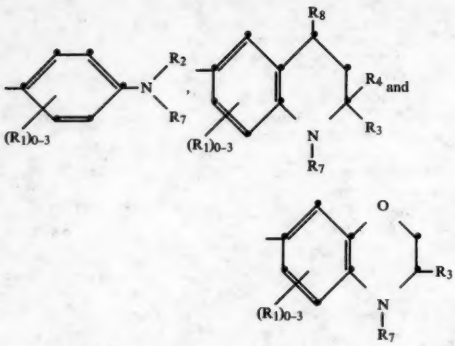
1. A dye having one of the structures



wherein: A is a group of the structure



rings E and G are unsubstituted or substituted in any position not occupied by a cinnamoyl group wherein the ring E substituent is selected from alkyl, halogen, cyano, carbamoyl, CONHalkyl, alkoxycarbonyl, alkanoyl, alkanoyloxy, alkylthio, alkenylthio, arylthio, cyclohexylthio, aryloxy, and alkoxy, and the ring G substituent is selected from alkyl, aryl, alkoxycarbonyl, alkanoyloxy, carbamoyl, CONHalkyl, $CON(alkyl)_2$, halogen, cyano, thiocyano, alkylthio, alkylsulfonyl, arylsulfonyl, formyl, alkanoyl, and aroyl; R_5 is H or alkyl; and each R_1 is a group selected from alkyl, aralkyl, alkenyl of 2–6 carbons, aryl, cyclohexyl, cyclohexylalkyl, alkoxy, halogen, hydroxy, alkylsulfonyl, cyano, carbamoyl, alkanoyl, alkanoyloxy, aroyl, alkoxycarbonyl, amino, sulfamoyl, alkylsulfamoyl, dialkylsulfamoyl, alkanoylamino, $SO_3C_6H_5$, alkylthio, thiocyano, arylsulfonyl, formyl, alkylcarbamoyl, dialkylcarbamoyl, NO_2, $—SO_3M$, $—OSO_3M$, —COOH, aryloxy, arylthio, alkylsulfonylamino, aroylamino, arylsulfonylamino, and cyclohexylthio, wherein the alkyl, alkylene, alkenyl, aryl, and cyclohexyl moieties of the above R_1 groups are unsubstituted or substituted with 1–3 substituents different from the parent moiety and independently selected from alkanoyloxy, alkyl, alkenyl, succinimido, $—NO_2$, alkanoylamino, alkylsulfonylamino, 1-(2-pyrrolidono), halogen, cyano, alkoxy, aryl, cyclohexyl, hydroxy, $—SO_3M$, $—OSO_3M$, aryloxy, furyl, aroyloxy, alkoxycarbonyl, $—SO_2N(alkyl)_2$, NHCOOalkyl, NHCONHalkyl, glutarimido, phthalimido, $CONH_2$, CONHalkyl, $CON(alkyl)_2$, alkoxyalkoxy, alkylthio, arylthio, alkylsulfonyl, and arylsulfonyl, wherein M is selected from H^+, NH_4^+, Na^+, K^+, and the colorless cations of sulfuric acid or sulfonic acid salts of trimethylamine, triethylamine, tri(2-hydroxyethyl)amine, di(2-hydroxyethyl)amine, and N,N-dimethylaniline; and wherein the couplers C^1 have the formulae:



wherein each R_1 is as defined above; R_2 and R_7 are each selected independently from hydrogen, alkyl, cyclohexylalkyl, alkenyl of 2–6 carbons, aryl, aralkyl and cyclohexyl, all of which groups including alkylene moieties are unsubstituted or substituted as defined above for the substituted R_1 groups; and R_3, R_4 and R_8 are each selected from hydrogen and alkyl.

4,593,088

2-AMINO-CINNAMOYLTHIOPHENE AZO DYES HAVING ANILINE, TETRAHYDROQUINOLINE, OR BENZOMORPHOLINE COUPLERS

Robert N. Gourley, Formby, England, assignor to Eastman Kodak Company, Rochester, N.Y.

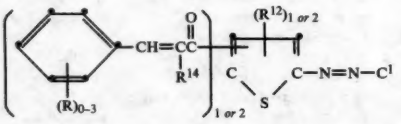
Filed Jan. 23, 1984, Ser. No. 573,185

Claims priority, application United Kingdom, Oct. 7, 1983, 8326866

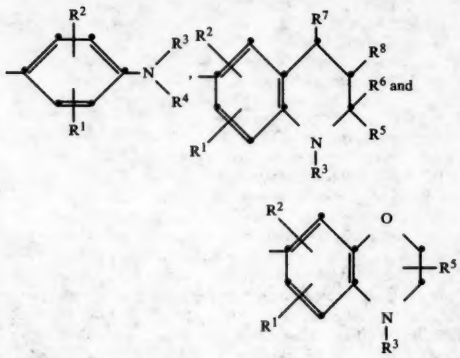
Int. Cl.[4] **C09B** *29/033, 29/09, 29/03;* **D06P** *3/54*

U.S. Cl. 534—768 **9 Claims**

1. A compound having the formula



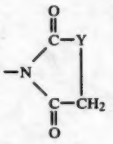
in which each R is a group selected from alkyl, hydroxy, alkoxy, carboxy, halogen, nitro, alkoxycarbonyl, alkanoyloxy, alkanoyl, alkylamino, cyano, dialkylamino, and alkyl substituted with 1–3 of halogen, alkoxy, alkanoyl, alkanoyloxy, alkoxycarbonyl, alkanoylamino, cyano, nitro, carbamoyl, alkylcarbamoyl, sulfamoyl, or alkylsulfamoyl; each R^{12} is selected from H, alkyl, alkoxy, acyl, halogen, alkylsulfonyl, alkanoyloxy, SO_2NH_2, $SO_2NHalkyl$, $SO_2N(alkyl)_2$, $CONH_2$, CONHalkyl, $CON(alkyl)_2$, arylsulfonyl, alkanoyl, alkanoylamino, aroyl, aryl, alkylthio, arylthio, alkenylthio, alkoxycarbonyl, hydroxyalkylcarbamoyl, cyclohexylthio, $SO_3C_6H_5$, cyano, thiocyano, cyclohexylsulfonyl, cyclohexyl, and alkyl substituted with 1–3 of alkoxy, CN, halogen, SO_2alkyl, CONHalkyl or $SO_2NHalkyl$; each R^{14} is hydrogen or alkyl; and C^1 is an aniline, tetrahydroquinoline, or benzomorpholine azo type dye coupler selected from



wherein:

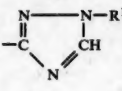
R^1 and R^2 are each selected from hydrogen, fluorine, chlorine, bromine, alkyl, cycloalkyl, alkoxy, phenoxy, alkylthio, arylthio, and radicals having the formula —NH—X—R^9 in which X is —CO—, —OOC—, —COO—, or —SO_2— and R^9 is selected from alkyl and alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, or alkoxy, and when X is —CO—, R^9 is also selected from hydrogen, amino, alkenyl, alkylamino, dialkylamino, arylamino, aryl, or furyl;

R^3 and R^4 are selected from hydrogen; cycloalkyl; cycloalkyl substituted with one or two groups selected from alkyl, —OH, alkoxy, halogen and hydroxy substituted alkyl; phenyl or phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, cyano or alkoxycarbonyl; straight or branched alkenyl; straight or branched alkyl and such alkyl substituted with 1–3 of the following: hydroxy; halogen; cyano; amino; alkoxy; hydroxyalkoxy; succinimido; glutarimido; phenylcarbamoyloxy; phthalimido, phthalimidino; 2-pyrrolidono; cyclohexyl; phenoxy; phenyl or phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, cyano or alkoxycarbonyl; alkanoylamino; sulfamoyl; alkylsulfamoyl; vinylsulfonyl; acrylamido; benzoylsulfonicimido; alkylsulfonamido; phenylsulfonamido; alkoxycarbonylamino; alkylcarbamoyloxy; alkoxycarbonyl; alkoxycarbonyloxy; alkenylcarbonylamino; groups of the formula



wherein Y is —NH—,

—O—, —S—, or —CH_2O—; —S—R^{10} wherein R^{10} is alkyl, phenyl, phenyl substituted with halogen, alkyl, alkoxy, alkanoylamino, cyano, or alkoxycarbonyl, pyridyl, pyrimidinyl, benzoxazolyl, benzimidazolyl, benzothiazolyl, or



—OXR^9; —NH—X—R^9; —X—R^9; —$CONR^{11}R^{11}$; —$SO_2NR^{11}R^{11}$; wherein R^9 and X are as defined above and each R^{11} is selected from H, alkyl, and alkyl substituted with 1–3 of halogen, hydroxy, phenoxy, alkoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyl, and alkanoyloxy; alkoxy substituted with hydroxy, cyano, alkanoyloxy, or alkoxy; phenoxy substituted with one or more of alkyl, alkoxy or halogen; or R^3 and R^4 combined form pentamethylene, ethyleneoxyethylene or ethylenesulfonylethylene which, with the nitrogen to which it is attached, forms a ring; and

R^5, R^6, R^7 and R^8 are each selected from hydrogen and alkyl.

4,593,089

FLUORESCENT POLARIZATION IMMUNOASSAY UTILIZING SUBSTITUTED TRIAZINYLAMINOFLUORESCEIN AMINOGLYCOSIDES

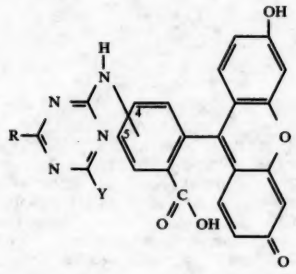
Chao-Huei J. Wang, Gurnee; Stephen D. Stroupe, Libertyville, and Michael E. Jolley, Round Lake, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 325,872, Nov. 30, 1981, Pat. No. 4,420,568, which is a continuation-in-part of Ser. No. 173,553, Jul. 30, 1980, abandoned. This application Oct. 31, 1983, Ser. No. 546,778

Int. Cl.[4] **C07H** *15/232, 15/234*

U.S. Cl. 536—13.6 **7 Claims**

1. A compound useful in a fluorescence polarization immunoassay for determining aminoglycosides, which compound has the formula:



wherein

Y is halo or lower alkyl; and

R is a ligand-analog having a molecular weight within the range of 50 to 4000 wherein said ligand-analog has at least one common epitope with an aminoglycoside ligand so as to be specifically recognizable by a common antibody;

and biologically acceptable salts thereof.

4,593,090

NOVEL NITROSOUREA COMPOUNDS, METHOD FOR PREPARING SAME, AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

Akira Kimura, Kamakura, Japan, assignor to Gogo Kimura, Kamakura, Japan

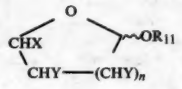
Filed May 24, 1982, Ser. No. 381,731

Claims priority, application Japan, Jun. 3, 1981, 56-84446

Int. Cl.[4] **C07H** *15/04*

U.S. Cl. 536—17.4 **18 Claims**

1. A compound of the structural formula



(I)

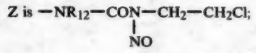
wherein

n is 1 or 2;

X is CH_2Y where n is 1, and

X is CH_2Y or H where n is 2, and

one of the radicals Y is Z and all other radicals Y are OH;



R_{11} is

a C_2–C_4 linear or C_3–C_4 branched alkyl substituted by C_1–C_4 alkoxy, methoxymethoxy, methoxyethoxy, or hydroxyethoxy radicals;

C_{3-8} cycloalkyl;

C_{1-3} alkyl substituted with C_{3-8} cycloalkyl groups;

benzyl;

benzyl having 1 to 3 substituents selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy and cyclopropyl;

phenethyl;

tetrahydrofurfuryl, furfuryl;

morpholinoethyl, morpholinopropyl;

pieridinoethyl; and

R_{12} is

a C_1–C_{10} linear or C_{3-10} branched alkyl;

C_3–C_5 linear or branched alkenyl or alkynyl;

C_{3-6} hydroxyalkyl;

C_{2-4} linear or C_{3-4} branched alkyl substituted by C_{1-4} alkoxy or C_{1-4} hydroxyalkoxy;

C_{3-8} cycloalkyl;

C_{1-3} alkyl substituted by a C_{3-8} cycloalkyl radical;

benzyl, chlorobenzyl;

benzyl having 1 to 3 substituents selected from the group consisting of C_{1-4} alkyl and C_{1-4} alkoxy;

tetrahydrofurfuryl;

furfuryl;

morpholino;

morpholino ethyl;

morpholinopropyl;

thiophen-2-yl-methyl;

pyridylethyl; and

piperidinoethyl.

4,593,091

METHOD FOR PREPARING GANGLIOSIDE DERIVATIVES AND USE THEREOF IN PHARMACEUTICAL COMPOSITIONS

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

Continuation-in-part of Ser. No. 290,106, Aug. 4, 1981, Pat. No. 4,476,119. This application Sep. 28, 1982, Ser. No. 425,462

Int. Cl.[4] **C08B** *37/00;* **C07H** *5/04*

U.S. Cl. 536—53 **14 Claims**

1. A method for preparing inner ester ganglioside derivatives, said derivatives comprising:

(a) a carbohydrate portion, at least one ceramide and at least one sialic acid moiety;

(b) said carbohydrate portion including at least one N-acetylgalactosamine or N-acetylglucosamine moiety and at least one glucose or galactose moiety;

(c) said acid moiety including at least one N-acetylneuraminic acid or N-glycolylneuraminic acid; and

(d) the carboxyl group of at least one of said acid moieties being ester bonded to a hydroxy group of one of said carbohydrates or one of said acid moieties to form a lactonic ring;

said method for preparing inner ester ganglioside derivatives comprising converting the carboxylate groups in a ganglioside or a mixture of gangliosides to carboxyl groups or to a salt thereof by means of ion exchange; and reacting, in a non-aqueous organic solvent, the converted ganglioside or a mixture of gangliosides or a salt of such ganglioside or mixture of gangliosides with a lactonization reagent to form at least one lactonic bond in said inner ester ganglioside derivatives, with the proviso that said solvent and lactonization reagent are not acetic acid or trichloroacetic acid.

7. A method for preparing inner ester ganglioside derivatives which comprises:

(a) dissolving a ganglioside or mixture of gangliosides obtained from a mammal in a non-aqueous aprotic solvent;

(b) adding an ion exchange resin to said ganglioside or mixture of gangliosides whereby the carboxylate groups of said gangliosides are converted to carboxyl groups; and

(c) treating said ganglioside or mixture with a lactonization reagent to form at least one lactonic bond in said inner ester ganglioside derivative, with the proviso that said solvent and lactonization reagent are not acetic acid or trichloroacetic acid.

4,593,092

CLASS OF SPIRO-LINKED PYRROLIDINE-2,5-DIONES

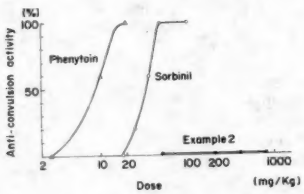
Tsutomu Irikura, Tokyo; Koichi Takagi, Omiya; Shizuyoshi Fujimori, Nogi, and Yoshihiro Hirata, Omiya, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,804

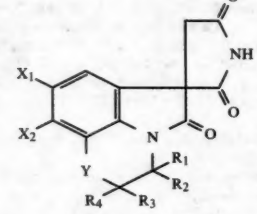
Claims priority, application Japan, Dec. 28, 1983, 58-246799

Int. Cl.[4] C07D *498/20, 513/20, 487/20*

U.S. Cl. 544—6 **8 Claims**



1. Spiro-linked pyrrolidine-2,5-diones of the formula;



[I]

and the base salts thereof with pharmaceutically acceptable cations, wherein X_1 and X_2 each independently represent a hydrogen, a halogen atom, a lower alkyl or lower alkoxy group; Y is a methylene group, a oxygen or sulfur atom; R_1, R_2, R_3 and R_4 each independently represent a hydrogen atom, a lower alkyl group or forming a benzene ring together with their adjacent carbon atoms.

4,593,093

ACYL DERIVATIVES

Roland Reiner, Basel, and Urs Weiss, Pratteln, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

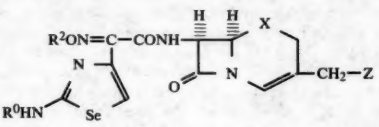
Division of Ser. No. 305,870, Sep. 28, 1981, Pat. No. 4,458,072. This application Apr. 16, 1984, Ser. No. 600,249

Claims priority, application Switzerland, Oct. 10, 1980, 7583/80; Aug. 18, 1981, 5335/81

Int. Cl.[4] C07D *421/14*

U.S. Cl. 544—22 **1 Claim**

1. A compound of the formula



wherein R^2 is hydrogen, lower alkyl or $COOR^3$-lower alkyl, in which R^3 is hydrogen, a cation of a base or a readily hydrolyzable ether group selected from the group consisting of lower alkanoyloxyalkyl esters, lower alkoxycarbonyloxyalkyl esters, lactonyl esters, lower alkoxymethyl esters, alkanoylaminomethyl esters, benzyl ester and cyanomethyl esters, and X is sulfur, oxygen or one of the groups—SO— and $—SO_2—$; R^0 is a cleavable protecting group selected from the group consisting of t-butoxycarbonyl, trityl and trifluoroacetyl; and Z is a leaving group selected from the group consisting of chlorine, bromine, iodine, lower alkylsulphonyloxy, mesyloxy, tosyloxy and azido and the carboxy group can be protected by salt formation with an inorganic or tertiary organic base.

4,593,094

2-[[[4-HALO-2-FLUORO-5(ALKYL OR ALKENYLOXY)PHENYL]AMINO]CARBONYL OR THIOCARBONYL]-3,4,5,6-TETRAHYDRO-1(2H)-PYRIDAZINECARBOXYLIC ACID COMPOUNDS AND LOWER ALKYL ESTERS THEREOF

Eiki Nagano, Hyogo; Shunichi Hashimoto, Osaka; Ryo Yoshida, Hyogo; Hiroshi Matsumoto, and Katsuzo Kamoshita, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

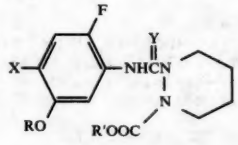
Division of Ser. No. 418,426, Sep. 15, 1982, Pat. No. 4,452,981. This application Mar. 22, 1984, Ser. No. 592,445

Claims priority, application Japan, Sep. 19, 1981, 56-148443; Feb. 19, 1982, 57-26512

Int. Cl.[4] C07D *237/04*

U.S. Cl. 544—224 **13 Claims**

1. A urea of the formula:



wherein X is a chlorine atom or a bromine atom, Y is an oxygen atom or a sulfur atom, R is a C_1-C_3 alkyl group, an allyl group or a propargyl group and R' is a lower alkyl group.

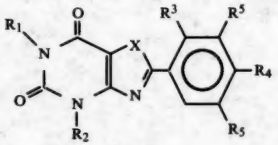
4,593,095

XANTHINE DERIVATIVES

Solomon H. Snyder, Baltimore; John W. Daly, Bethesda, both of Md., and Robert F. Bruns, Ann Arbor, Mich., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 18, 1983, Ser. No. 467,894
Int. Cl.[4] C07D *239/36;* A61K *31/52*
U.S. Cl. 544—272 5 Claims

1. A compound, which in its free base form, has the formula



wherein

X is NH;

R_1 is allyl, alkyl of 2–6 carbons, or cycloalkyl of 3 to 6 carbons, the lower alkyl or cycloalkyl being optionally substituted with hydroxy, lower alkoxy or cyano;

R_2 is hydrogen, allyl, lower alkyl or cycloalkyl, the lower alkyl or cycloalkyl being optionally substituted as hereinafter described,

R_3 is NH_2 or OH;

R_4 is halogen, halo-lower alkyl, phenyl, amino, carboxy, lower alkyl, cycloalkyl, lower alkoxy, cycloalkoxy, lower alkoxy amino, lower alkyl amino or cycloalkylamino, the lower alkoxy, lower alkyl or cycloalkyl in each instance being optionally substituted with hydroxy, amino, methylamino, dimethylamino or carboxy; and

R_5, which may be the same or different, are hydrogen, lower alkyl, lower alkoxy, halogen, hydroxy, nitro or amino.

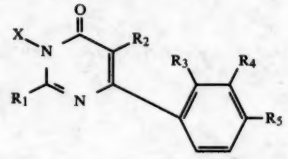
4,593,096

NOVEL COMPOUNDS AND PROCESS FOR TREATING HYPERTENSION

Wendell Wierenga, and Harvey I. Skulnick, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 386,846, Jun. 9, 1982, Pat. No. 4,460,589, which is a continuation of Ser. No. 193,574, Oct. 3, 1980, abandoned. This application Feb. 23, 1984, Ser. No. 582,674
Int. Cl.[4] C07D *239/47*
U.S. Cl. 544—321 3 Claims

1. A compound of the formula



wherein

X is alkyl of from 1 to 3 carbon atoms, inclusive, or alkenyl of from 3 to 5 carbon atoms, inclusive,

R_1 is $—NH_2$,

R_2 is chloro, bromo or iodo,

R_3 is hydrogen or fluorine,

R_4 is hydrogen or fluorine, and

R_5 is hydrogen, fluorine or CH_3; or a salt thereof.

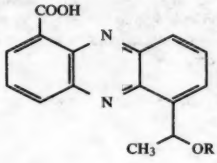
4,593,097

PHENAZINE CARBOXYLIC ACID DERIVATIVES AND A PROCESS FOR PRODUCTION THEREOF

Fusao Tomita; Keiichi Takahashi, both of Machida; Isao Kawamoto, Hiratsuka; Kozo Asano, Machida; Makoto Morimoto, Shizuoka; Tadashi Ashizawa, Numazu, and Kazuhisa Fujimoto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 575,294
Claims priority, application Japan, Jan. 28, 1983, 58-12383
Int. Cl.[4] C07D *241/46;* C12P *17/12*
U.S. Cl. 544—347 5 Claims

1. A phenazine compound represented by the formula:



wherein R represents an unsubstituted or substituted lower alkanoyl group; the substituent of the lower alkanoyl group being a member selected from the group consisting of a hydroxyl group, a halogen atom and t-butoxy.

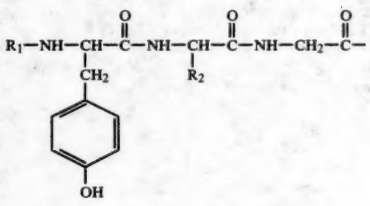
4,593,098

PIPERAZINONE AND PIPERAZINE POLYPEPTIDES

Malcolm W. Moon, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 48,330, Jun. 14, 1979, Pat. No. 4,251,438. This application May 27, 1980, Ser. No. 153,435
Int. Cl.[4] C07D *403/00;* C07C *103/52*
U.S. Cl. 544—373 24 Claims

1. A compound of the formula



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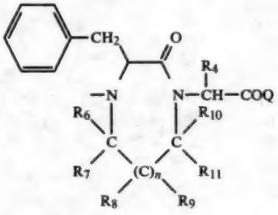
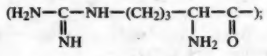


and pharmaceutically acceptable salts thereof where

R_1 is a hydrogen atom, methyl group or L-arginyl



R_2 is a hydrogen atom, alkyl of 1 thru 3 carbon atoms, hydroxalkyl where the alkyl portion is 1 thru 3 carbon atoms or $R_{2a}—S—R_{2b}—$ with the proviso that when R_2 is not a

hydrogen atom the carbon atom to which R_2 is attached is of the D configuration;

R_{2a} is alkyl of 1 thru 3 carbon atoms;

R_{2b} is alkyl of 1 thru 3 carbon atoms;

R_4 is a hydrogen atom, alkyl of 1 thru 6 carbon atoms, cycloalkyl substituted alkyl of 4 thru 7 carbon atoms total, hydroxyalkyl where the alkyl portion is 1 thru 4 carbon atoms, R_{4a}—S—R_{4b}— or amino substituted alkyl where the alkyl portion is 2 thru 5 carbon atoms;

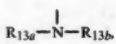
R_{4a} is alkyl of 1 thru 3 carbon atoms;

R_{4b} is alkyl of 1 thru 3 carbon atoms;

R_6, R_7, R_8, R_9, R_{10}, R_{11} are when present independently a hydrogen atom, alkyl of 1 thru 4 carbon atoms, cycloalkyl of 3 thru 5 carbon atoms, cycloalkyl substituted alkyl of 4 thru 7 carbon atoms total with the proviso that the total number of carbon atoms in all these groups together when present is 0 thru 10;

n is 0 or 1; and

Q is hydroxyl, alkoxy where the alkyl group is 1 thru 3 carbon atoms, amino



cycloalkyl substituted alkylamino where the cycloalkyl substituted alkyl portion is 4 thru 7 carbon atoms;

R_{13a} is a hydrogen atom or alkyl of 1 thru 4 carbon atoms; and

R_{13b} is alkyl of 1 thru 4 carbon atoms.

4,593,099

(TETRAZOLYL) THIENOPYRIDINONES

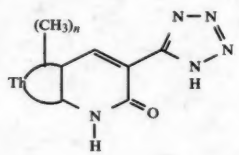
Terry L. Wright, Antioch, Calif., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Oct. 10, 1984, Ser. No. 659,397

Int. Cl.[4] C07D *495/04*

U.S. Cl. 546—114 **3 Claims**

1. A compound of the formula



wherein Th is a thiophene fused to the pyridine ring and n is 0, 1 or 2; and the pharmaceutically acceptable salts thereof.

4,593,100

3A,4,7,7A-TETRAHYDRO-3,6,7A-TRIMETHYL-4-SUBSTITUTED PHENYL-ISOXAZOLO[5,4-b]PYRIDINE-5-CARBOXYLIC ACID ESTERS

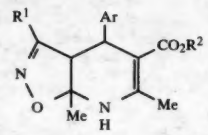
Dong H. Kim, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,884

Int. Cl.[4] C07D *498/04*

U.S. Cl. 546—115 **5 Claims**

1. A compound of the formula:



wherein

Ar is phenyl or phenyl substituted by a halogen, nitro, or trifluoromethyl group; R^1 is C_{1-3} alkyl; and R^2 is C_{1-5} alkyl, (C_{1-5}) alkoxy (C_{1-3}), or mono- or diC_{1-5}) alkylamino (C_{1-3}) alkyl;

or physiologically acceptable acid addition salts thereof.

4,593,101

PROCESS FOR THE PREPARATION OF 4-QUINOLINONES

Michel Arnaud, Salindres, and Jean-Pierre Corbet, Ecully, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

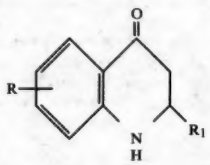
Filed Sep. 20, 1984, Ser. No. 652,527

Claims priority, application France, Sep. 22, 1983, 83 15073

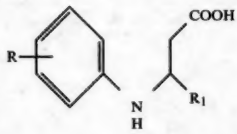
Int. Cl.[4] C07D *215/18, 215/22*

U.S. Cl. 546—153 **7 Claims**

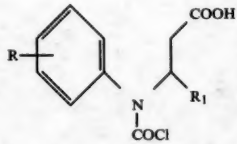
1. A process for the preparation of a 1,2,3,4-tetrahydro-4-quinolinone of the formula:



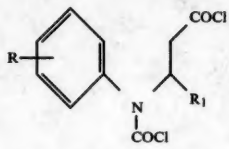
in which R denotes a hydrogen atom, a halogen atom, a linear or branched alkyl group of 1 to 4 carbon atoms or a linear or branched alkoxy group of 1 to 4 carbon atoms, and R_1 denotes a hydrogen atom or a linear or branched alkyl group of 1 to 4 carbon atoms, which comprises treating a 3-anilinopropinoic acid of the formula:



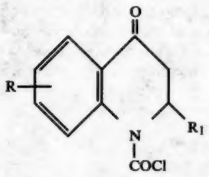
in which R and R_1 are as defined above, with phosgene to produce a product of the formula:



in which R and R_1 are as defined above, reacting the said product with phosgene in the presence of dimethylformamide, to produce an acid chloride of the formula:



in which R and R_1 are as defined above, treating the latter with a aluminum chloride in a suitable solvent to provide a product of formula:



in which R and R_1 are as defined above, and hydrolysing the latter in the presence of an inert inorganic base to provide the 1,2,3,4-tetrahydro-4-quinolinone.

4,593,102

N-[(AMINO)ALKYL]-1-PYRROLIDINE, 1-PIPERIDINE AND 1-HOMOPIPERIDINECARBOXAMIDES (AND THIOCARBOXAMIDES) WITH SULFUR LINKED SUBSTITUTION IN THE 2, 3 OR 4-POSITION

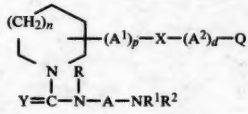
James R. Shanklin, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 598,582, Apr. 10, 1984, abandoned. This application Jul. 1, 1985, Ser. No. 750,156

Int. Cl.[4] C07D *211/46*

U.S. Cl. 546—216 **38 Claims**

1. A compound selected from the group having the formula:



wherein;

n is selected from zero, one or two;

Y is selected from oxygen or sulfur;

A, A^1 and A^2 are selected from straight or branched-chain alkalenes having 1 to 8 carbon atoms and p and d are selected from zero or one with the proviso that when the $—(A^1)_p—X—(A^2)_d—Q$ radical is in the 2-position, p is at at least one;

X is selected from —S—, —S(O)— or $—S(O)_2—$;

R, R^1 and R^2 are selected from hydrogen, loweralkyl (1–8 carbons), phenyl, cycloalkyl (1–9 carbons) or phenylalkyl (7–14 carbons) and may be the same or different and R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of

(a) 1-pyrrolidino,

(b) 1-piperidino,

(c) 4-morpholino,

(d) 1-piperazino,

(e) a heterocycle of (a) to (d) substituted by a methyl, ethyl, phenyl or phenylloweralkyl,

(f) 2,6-(loweralkyl)$_2$-piperidino,

(g) 4-hydroxy-4-phenylpiperidino,

(h) 4-cyano-4-phenylpiperidino, or,

(i) 4-phenyl-1,2,3,6-tetrahydropyridino,

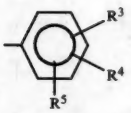
Q is selected from the group consisting of:

(1) 1 or 2-naphthyl,

(2) 2,3-dihydro-1H-inden-4-yl or 2,3-dihydro-1H-inden-5-yl,

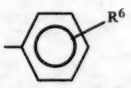
(3) biphenyl,

(4) phenyl,



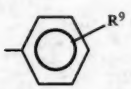
(5)

wherein R^3 is selected from fluorine, chlorine, bromine, iodine, loweralkyl (1–8 carbons), loweralkoxy (1–8 carbons), trifluoromethyl, hydroxy, cyano or nitro, R^4 is selected from hydrogen, fluorine, chlorine, bromine, iodine, methyl, ethyl, isopropyl, methoxy, ethoxy and nitro and R^5 is selected from hydrogen, methyl, ethyl, methoxy, ethoxy, methylthio and phenylthio,



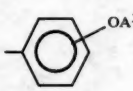
(6)

wherein R^6 is selected from $—NR^7R^8$, $—C(O)NR^7R^8$, $—(CH_2)_bNR^7R^8$, $—B—(CH_2)_bNR^7R^8$ or $—B—(CH_2)_bOR^7$ wherein B is selected from —O—, —S—, —S(O)— or $—S(O)_2—$, b is 2 or 3 and R^7 and R^8 are selected from hydrogen, loweralkyl (1–8 carbons), and may be the same or different,



(7)

wherein R^9 is selected from $—SR^{10}$, $—S(O)R^{10}$ and $—S(O_2)R^{10}$ wherein R^{10} is selected from loweralkyl (1–8 carbons) and phenyl with the proviso that X must be $—S(O)_2—$, or,



(8)

wherein A^3 is selected from straight or branched-chain alkalenes (2–8 carbons) and G is selected from loweralkoxy (1–8 carbons) or $—NR^{11}R^{12}$ wherein R^{11} and R^{12} are selected from hydrogen, loweralkyl (1 to 8 carbons), phenyl and phenylloweralkyl (7–14 carbons) and may be the same or different, and the pharmaceutically acceptable acid addition salts and hydrates thereof.

4,593,103

POLYOXAZOLINE COMPOUNDS

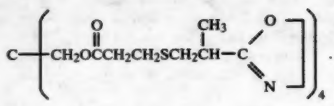
Mark R. Johnson, Breckenridge, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1983, Ser. No. 525,334

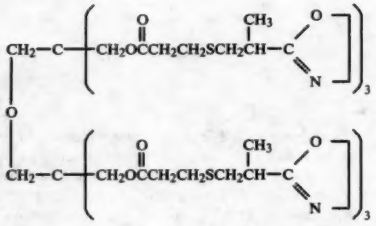
Int. Cl.[4] C07D *413/12*

U.S. Cl. 548—239 **2 Claims**

1. A compound having the structure:



2. A compound having the structure:

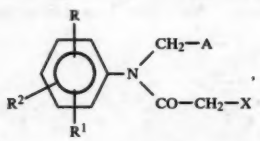


4,593,104
2-HALO-N-(AZOLE-1-YL-METHYL)-SUBSTITUTED ACETANILIDES

Karl Eicken, Wachenheim; Wolfgang Rohr, Mannheim; Bernd Zeeh, Ludwigshafen, and Bruno Würzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 839,777
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648008
Int. Cl.[4] C07D *231/12, 233/61*
U.S. Cl. 548—262 12 Claims

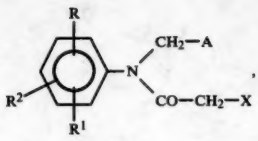
1. An acetanilide of the formula



I

where R is hydrogen, alkyl of a maximum of 5 carbon atoms, or alkoxy of a maximum of 5 carbon atoms, R' is hydrogen, halogen, alkyl of a maximum of 5 carbon atoms, alkoxy of a maximum of 5 carbon atoms, perhaloalkyl of a maximum of 4 carbon atoms, or alkoxyalkyl of a maximum of 5 carbon atoms, R^2 is hydrogen, halogen, alkyl of a maximum of 5 carbon atoms, alkoxy of a maximum of 5 carbon atoms, perhaloalkyl of a maximum of 4 carbon atoms, or alkoxyalkyl of a maximum of 5 carbon atoms, X is chloro, bromo, or iodo, and A is azole selected from the group consisting of 1,2,4-triazole and 1,2,3-triazole which is linked via a ring nitrogen atom and is unsubstituted or mono- or polysubstituted by halogen, phenyl, alkyl, alkoxy, alkylthio or perfluoroalkyl, each of maximum of 4 carbon atoms, or A is an acid addition salt of the azole cyano, carboxy, carbalkoxy of a maximum of 4 carbon atoms in the alkoxy group, or alkanoyl of a maximum of 4 carbon atoms.

2. An acetanilide of the formula



I

where R is hydrogen, alkyl of a maximum of 5 carbon atoms, or alkoxy of a maximum of 5 carbon atoms, R' is hydrogen, halogen, alkyl of a maximum of 5 carbon atoms, alkoxy of a maximum of 5 carbon atoms, perhaloalkyl of a maximum of 4 carbon atoms, or alkoxyalkyl of a maximum of 5 carbon atoms, R^2 is hydrogen, halogen, alkyl of a maximum of 5 carbon atoms, alkoxy of a maximum of 5 carbon atoms, perhaloalkyl of a maximum of 4 carbon atoms, or alkoxyalkyl of a maximum of 5 carbon atoms, X is chloro, bromo, or iodo, and A is a C_1–C_4 alkoxy substituted pyrazole which is linked via a ring nitrogen atom, or A is an acid addition salt of the C_1–C_4 alkoxy substituted pyrazole.

7. 2-Chloro-2',3',6'-trimethyl-N-(pyrazol-1-yl-methyl-)acetanilide.

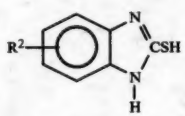
8. 2-chloro-2',6'-dimethyl-N-(3,5-dimethylpyrazol-1-yl-methyl)acetanilide.

4,593,105
PROCESS FOR MAKING 2-MERCAPTO BENZIMIDAZOLES IN THE PRESENCE OF A WATER-INSOLUBLE ALKANOL

Richard A. Gencarelli, Waterbury, and Edward L. Wheeler, Watertown, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

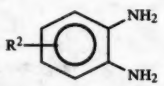
Continuation-in-part of Ser. No. 259,732, May 1, 1981, abandoned. This application Sep. 1, 1982, Ser. No. 413,921
Int. Cl.[4] C07D *235/28*
U.S. Cl. 548—329 5 Claims

1. A process for making a benzimidazole having the formula:



wherein R^2 is hydrogen or methyl comprising:

(a) reacting a compound having the formula ZSCN, wherein Z is Na, K or NH_4, with a compound having the formula:



wherein R^2 has the meanings above, in the presence of a n-hexanol or 2-ethylhexanol alcohol, and, except when Z is NH_4, in the presence of an acid;

(b) azeotropically removing the water from the reaction mixture;

(c) extracting the benzimidazole from the alcohol with aqueous caustic;

(d) neutralizing the reaction mixture (c) with acid; and

(e) isolating the imidazole from the neutralized reaction mixture.

4,593,106

4-[2-(DIALKYLAMINO)ETHYL]-7-HYDROXYISATINS

Orum D. Stringer, Philadelphia; Joseph Weinstock, Phoenixville, and James W. Wilson, Wayne, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jun. 4, 1984, Ser. No. 616,635
Int. Cl.[4] C07D 209/38
U.S. Cl. 548—485 2 Claims

1. 4-[2-(Di-n-propylamino)ethyl]-7-isobutyryloxyisatin as the free base.

2. 4-[2-(n-Propyl-4'-hydroxypehenethylamino)ethyl]-7-hydroxyisatin or a pharmaceutically acceptable acid addition salt thereof.

4,593,107

5-ACETYLOXY-L-TRYPTOPHANE AND PREPARATION METHOD THEREOF

Jacques Viret, 89 B, Route de Florissant, Geneve, Switzerland (1206)

Continuation of Ser. No. 508,563, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 345,736, Feb. 4, 1982, abandoned. This application Sep. 21, 1984, Ser. No. 653,057
Claims priority, application France, Feb. 4, 1981, 81 02172
Int. Cl.[4] C07D 209/20
U.S. Cl. 548—496 4 Claims

1. A compound which is 5-acetyloxy-L-tryptophane or its pharmaceutically acceptable acid addition salts.

4. A method of preparing 5-acetyloxy-L-tryptophane from 5-hydroxy-L-tryptophane comprising the steps of:

(a) reacting 5-hydroxy-L-tryptophane with perchloric acid in solution in anhydrous acetic acid;

(b) treating an equivalent of the resulting product with at least 1 equivalent of acetic anhydride to obtain 5-acetyloxy-L-tryptophane acetate; and

(c) neutralizing the 5-acetyloxy-L-tryptophane acetate with ammonium hydroxide to obtain 5-acetyloxy-L-tryptophane.

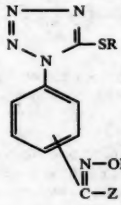
4,593,108

1-PHENYL-5-MERCAPTO TETRAZOLES

Avinash C. Mehta, Belmont; George H. Nawn, Westwood, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 222,543, Jan. 5, 1981, Pat. No. 4,355,092. This application Jun. 11, 1982, Ser. No. 387,449
The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.
Int. Cl.[4] C07D 257/04
U.S. Cl. 548—251 8 Claims

1. A compound which is represented by the formula



wherein R is H, an alkali metal or a group which is cleavable in aqueous alkaline medium and Z is H, alkyl having from 1 to 10 carbon atoms, benzyl, phenethyl or phenyl.

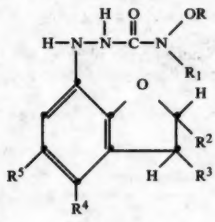
4,593,109

MITICIDAL 1-(2-ALKYL-2,3-DIHYDROBENZOFURAN-7-YL)-4-ALKOXY-4-ALKYLSEMICARBAZIDES

Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 22, 1984, Ser. No. 643,328
Int. Cl.[4] C07D 307/78, 307/82, 307/87; A01N 9/28
U.S. Cl. 549—467 3 Claims

1. A compound of the Formula



(I)

wherein R, R^1 and R^2 each is alkyl of one to three carbon atoms; R^3 is hydrogen or alkyl of one to three carbon atoms; one of R^4 and R^5 is bromine or chlorine, and the other is alkyl of one to three carbon atoms.

4,593,110

PREPARATION OF 1,3-DIOXA-5,5,6,6,7,7-HEXAFLUOROCYCLOOCTANE

Judah M. Goldwasser; Horst G. Adolph, and Cynthia L. Ebner, all of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 8, 1985, Ser. No. 752,704
Int. Cl.[4] C07D 321/12
U.S. Cl. 549—347 4 Claims

1. A process for preparing 1,3-dioxa-5,5,6,6,7,7-hexafluorocyclooctane comprising the steps of

(1) reacting one mole of 2,2,3,3,4,4-hexafluoropentane-1,5-diol with one mole of formaldehyde in the presence of an excess of trifluoromethanesulfonic acid; and

(2) isolating the product 1,3-dioxa-5,5,6,6,7,7-hexafluorocyclooctane.

4,593,111

SILYL ISOTHIOCYANATES

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Ltd., Maidenhead, England

Continuation-in-part of Ser. No. 506,278, Jun. 21, 1983, Pat. No. 4,539,406. This application May 24, 1985, Ser. No. 737,980
Claims priority, application United Kingdom, Jun. 25, 1982, 8218464
Int. Cl.[4] C07F 7/10, 7/18
U.S. Cl. 556—410 8 Claims

1. A compound of formula IIIA

$$R_x^a Si(NCS)_{3-x} \qquad \text{IIIA}$$

wherein R^a is selected from elecuron donating substituents consisting of alkoxy of 1–10 carbon atoms, cycloalkoxy of 4–8 carbon atoms, aralkoxy of 7–12 carbon atoms, phenoxy, which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms or trifluoromethyl, the group R^bR^cN- wherein R^b and R^3 are selected from alkyl of 1–6 carbon atoms, cycloalkyl of 4–6 carbon atoms, phenyl which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms or trifluoromethyl, and aralkyl of 7–12 carbon atoms or R^b and R^c may be joined to form a pyrrolidinyl or piperidinyl ring with the nitrogen atom, which ring may be substituted to alkyl of 1–10 carbon atoms; alkylthio of 1–10 carbon atoms,

cycloalkylthio of 4–8 carbon atoms, aralkylthio of 7–12 carbon atoms, phenylthio which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms or trifluoromethyl, and hydrocarbon substituents selected from alkyl of 1–10 carbon atoms, cycloalkyl of 4–8 carbon atoms, aralkyl of 7–12 carbon atoms, or phenyl which may be substituted by alkyl of 1–10 carbon atoms, alkoxy of 1–10 carbon atoms or trifluoromethyl, at least one group R^a being an electron donating substituent, with the provisos that:

(i) when x is 3 and all three R^a groups are the same alkoxy then the alkoxy group has at least 3 carbon atoms;

(ii) when R^a is alkoxy and x is 1 then R^a is other than propoxy;

(iii) when one or more R^a are alkylthio and the others (if any) are alkyl then the alkylthio group has at least 2 carbon atoms;

(iv) when R^a is aryloxy and x is 3 then at least one group R^a is other than aryloxy.

4,593,112

METHOD FOR THE PREPARATION OF A TERT-HYDROCARBYL SILYL COMPOUND

Minoru Takamizawa; Toshinobu Ishihara, and Akira Yamamoto, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,669

Claims priority, application Japan, Apr. 17, 1984, 59-77156

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—480 **3 Claims**

1. A method for the preparation of a tert-hydrocarbyl silyl compound having at least one hydrogen atom directly bonded to the silicon atom which comprises reacting a Grignard reagent represented by the general formula R^1MgX, in which R^1 is a tert-hydrocarbyl group and X is a halogen atom, and a silane compound represented by the general formula $X_mR^2_nSiH_{4-m-n}$, in which R^2 is a monovalent hydrocarbon group, X is a halogen atom, m is 1, 2 or 3 and n is zero, 1 or 2 with the proviso that m+n does not exceed 3, in an organic solvent.

4,593,113

SYNTHESIS OF TRANSITION METAL DITHIENE COMPLEXES

Martin H. Kauffman, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 14, 1985, Ser. No. 691,591

Int. Cl.[4] C07F *15/00*

U.S. Cl. 556—136 **10 Claims**

1. A process for the synthesis of a transition metal dithiene complex comprising:

a. reacting a dimethylaminobenzoin with a phosphorus sulfide and dioxane under suitable reaction conditions to produce a dioxane insoluble thiophosphoric ester derivative of the benzoin;

b. adding excess dioxane and dissolving said thiophosphoric ester derivative in a highly polar aprotic solvent;

c. reacting said ester derivative dissolved in said aprotic solvent with an aqueous solution of a reactive water soluble ionizable compound of a transition metal complex; and

d. purifying and recovering the thus prepared metal dithiene complex.

4,593,114

DIRECT PROCESS FOR PREPARING DIMETHYLSILOXANES

Kenrick M. Lewis, New York, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 650,087, Sep. 13, 1984, abandoned. This application May 29, 1985, Ser. No. 739,124

Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—450 **36 Claims**

1. A process for preparing cyclic and oligomeric organosiloxanes comprising reacting a hydrocarbon ether and a hydrocarbon halide with a fluidized or agitated bed of activated silicon particles at a maximum contact time of 5 minutes, and continuously withdrawing products from said reaction.

4,593,115

METHOD FOR PRODUCING 1-IODOALKYL ACYLATES

Akio Miyake, and Masayoshi Yamaoka, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

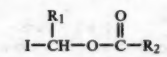
Filed Nov. 21, 1984, Ser. No. 673,944

Claims priority, application Japan, Nov. 25, 1983, 58-222827

Int. Cl.[4] C07C *67/14*

U.S. Cl. 560—1 **8 Claims**

1. A method for producing an 1-iodoalkyl acylate of the formula:



wherein R_1 hydrogen, a straight-chain or branched alkyl group of 1 to 6 carbon atoms, or a cycloalkyl group of 3 to 7 carbon atoms and R_2 is a cycloalkyl group of 3 to 7 carbon atoms, a straight-chain or branched alkyl group of 1 to 10 carbon atoms, which is non-substituted or substituted by phenyl or a cycloalkyl group of 3 to 7 carbon atoms, which comprises reacting a compound of the formula:

R_1CHO

wherein R_1 has the same meaning as defined above; a compound of the formula:

R_2COCl

wherein R_2 has the same meaning as defined above; and sodium iodide in a reaction mixture.

4,593,116

PROCESS FOR THE PRODUCTION OF URETHANES

Günter Stammann, Cologne; Johann Grolig, Leverkusen; Robert Becker, Leverkusen, and Helmut Waldmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 620,207

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322668

Int. Cl.[4] C07C *125/065, 125/073, 125/067, 125/075*

U.S. Cl. 560—24 **15 Claims**

1. A process for the production of a urethane in which an organic nitro compound is reacted with an organic compound containing at least one hydroxyl group in the presence of carbon monoxide, hydrogen and a catalyst system which catalyst system comprises

(1) at least one noble metal or compound of a noble metal in Group VIIIB of the Periodic System of Elements,

(2) at least one co-catalyst which is a combination of

(a) at least one oxidic or hydroxidic compound of iron or copper and

(b) at least one compound containing chlorine anionically bound as chloride selected from

(i) chlorides and oxychlorides of elements of Groups IIIA, IVA, VA, and/or I-VIII B of the Periodic System of Elements other than the noble metals of Group VIII B and/or

(ii) organic ammonium chlorides and

(3) at least one organic nitrogen base in which the carbon monoxide and hydrogen are used in quantities such that the molar ratio of carbon monoxide to hydrogen is from 0.3:1 to 3:1.

4,593,117

PROCESS FOR THE PREPARATION OF N- AND O-SUBSTITUTED DIURETHANES AND/OR POLYURETHANES

Hartmut Knöfel, Odenthal; Stefan Penninger, Dormagen; Günther Hammen, Dormagen, and Peter Heitkämper, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 354,976, Mar. 5, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,430

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110573

Int. Cl.[4] C07C *125/073, 125/077*

U.S. Cl. 560—025 **13 Claims**

1. A process for the preparation of a low molecular weight N- and O-substituted diurethane and/or polyurethane comprising:

(a) reacting a diamine and/or polyamine having primary amino groups with an N-aryl-O-alkyl urethane in the presence of at least one high boiling alcohol at an elevated temperature; and

(b) continuously removing the thus-formed arylamine corresponding to the N-aryl-O-alkyl urethane from the reation mixture by distillation.

4,593,118

2-AMIDO-3-AMINOCARBOXYLIC ACID ESTERS AND PROCESS OF PREPARATION THEREOF

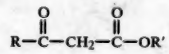
Beverly A. Bauer, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 563,704, Dec. 21, 1983, abandoned, and a continuation-in-part of Ser. No. 563,705, Dec. 21, 1983, abandoned, and a continuation-in-part of Ser. No. 563,706, Dec. 21, 1983, abandoned. This application Mar. 6, 1985, Ser. No. 708,893

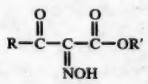
Int. Cl.[4] C07C *101/02, 125/065*

U.S. Cl. 560—41 **12 Claims**

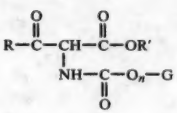
1. A process which comprises (A) nitrosating a β-keto ester corresponding to the formula:



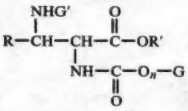
by treating it with sodium nitrite and a strong acid so as to form a 3-keto-2-oximino ester corresponding to the formula:



(B) converting the oximino ester to a protected 2-amine corresponding to the formula:

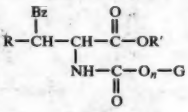


by (1) simultaneously or consecutively reacting it with hydrogen and an acid anhydride in the presence of a hydrogenation catalyst or (2) reacting it with hydrogen and an acid in the presence of a hydrogenation catalyst and then with a protecting agent corresponding to the formula ClCOOG, and (C) reductively aminating the 3-position of the protected 2-amine by reacting it with ammonia or a primary amine in the presence of sodium cyanoborohydride so as to form a 2-amido-3-aminocarboxylic acid ester corresponding to the formula:



in which formulas R, R', and G are independently selected from alkyl, cycloalkyl, and aryl groups containing 1–10 carbons; G' represents hydrogen or an alkyl, cycloalkyl, or aryl group containing 1–10 carbons; and n is zero or one.

10. A 3-benzylamino-2-amidocarboxylic acid ester corresponding to the formula:



wherein Bz is benzylamino; R, R', and G are independently selected from alkyl, cycloalkyl, and aryl; and n is zero or one.

4,593,119

METHOD FOR TREATMENT OR PROPHYLAXIS OF CARDIAC DISORDERS

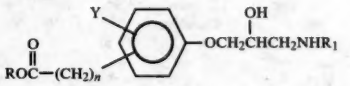
Paul W. Erhardt, and Robert J. Borgman, both of Mundelein, Ill.; John P. O'Donnell, Morgantown, West Va. assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 211,345, Nov. 28, 1980, Pat. No. 4,387,103. This application Dec. 16, 1982, Ser. No. 450,228

Int. Cl.[4] C07C *101/72, 121/52*

U.S. Cl. 560—42 **6 Claims**

1. A compound of the formula



wherein R is methyl or ethyl; the ester-containing group is in the para position on the phenyl ring with respect to the amine-containing group; n is 2; R_1 is lower alkyl of from 1 to about 5 carbon atoms; and Y is hydrogen, lower alkyl of from 1 to about 5 carbon atoms, lower alkenyl of from 2 to about 5 carbon atoms, lower alkynyl of from 2 to about 5 carbon atoms, lower alkoxy of from 1 to about 5 carbon atoms, halogen, acetamido, amino, nitro, lower alkylamino of from 1 to about 5 carbon atoms, hydroxy, lower hydroxyalkyl of from 1 to about 5 carbon atoms, or cyano; or a pharmaceutically acceptable salt thereof.

4,593,120

NAPHTHALENE ANTI-PSORIATIC AGENTS

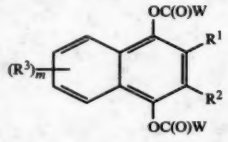
Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco, and John M. Young, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 437,063, Oct. 27, 1982, Pat. No. 4,466,981. This application Dec. 22, 1983, Ser. No. 564,155

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—107 31 Claims

1. A composition in a form suitable for topical administration for treating the condition of psoriasis which composition comprises a pharmaceutically acceptable, non-toxic carrier and a psoriasis relieving amount of a compound of the formula



(I)

wherein:

R^1 and R^2 are the same and are lower alkoxy of one to six carbon atoms, lower alkylthio of one to six carbon atoms, phenoxy or phenylthio optionally substituted by one or two lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms or halo;

R^3 is lower alkyl of one to six carbon atoms, lower alkoxy of one to six carbon atoms, or halo and m is 0, 1 or 2 or R^3 is optionally substituted phenyl, optionally substituted phenyl lower alkyl, optionally substituted phenyl lower alkoxy, amino, lower alkylamino, lower dialkylamino, cyano, or $S(O)_nR$ wherein R is lower alkyl of one to six carbon atoms; optionally substituted phenyl; optionally substituted phenyl lower alkyl; or heterocyclic aryl of three to nine ring atoms containing one or two heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur wherein the heterocyclic aryl is optionally substituted by one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, halo and cyano and the pharmaceutically acceptable acid addition salts thereof; and m is 1 and n is 0, 1 or 2; and

W is alkyl of one to seven carbon atoms, phenyl or benzyl optionally substituted by one or two lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms or halo; with the proviso that when R^1 and R^2 are alkoxy or alkylthio and W is alkyl, m is 2.

4,593,121

NOVEL ACRYLATES AND THEIR MANUFACTURING METHODS

Yasuhiro Okamoto; Takashi Watanabe, and Motonobu Kubo, all of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

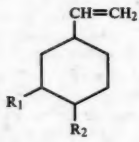
Filed Sep. 17, 1985, Ser. No. 776,867

Claims priority, application Japan, Feb. 26, 1985, 60-36956

Int. Cl.[4] C07C *69/00*

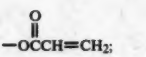
U.S. Cl. 560—144 3 Claims

1. Acrylates represented by a following general formula (I),



(I)

wherein R_1 and R_2 indicate —OH or



however, a case of $R_1=R_2=$—OH is excluded.

4,593,122

PROCESS FOR PREPARING TEREPHTHALIC ACID BY THE CATALYTIC OXIDATION WITH AIR OF P-XYLENE IN A WATER CONTAINING ACETIC ACID SOLVENT

Hiroshi Hashizume, Kurashiki, and Yoshiaki Izumisawa, Kitakyushu, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,264

Claims priority, application Japan, Aug. 9, 1983, 58-145407

Int. Cl.[4] C07C *51/265*

U.S. Cl. 562—414 9 Claims

1. A process for producing terephthalic acid from p-xylene continuously, wherein p-xylene is oxidized to terephthalic acid by air in the presence of a catalyst containing cobalt, manganese and bromine at a temperature of 180° to 230° C. in a water containing acetic acid solvent in which the concentration of oxygen gas contained in an exhaust gas obtained from the reaction vessel used for oxidizing p-xylene is 2 to 8% by volume, said process comprising:

(a) preparing an oxidation exhaust gas by condensing a gas withdrawn from said reaction vessel for removing condensates from said gas;

(b) dividing the prepared oxidation exhaust gas into a discharged gas and a recycled gas, in which the volume ratio of said recycled gas to said discharged gas is 0.3 to 5, said discharged gas being exhausted to the outside of the reaction system;

(c) supplying continuously said recycled gas to the liquid phase of said reaction vessel; and

(d) carrying out the oxidation reaction of p-xylene under reaction pressure higher than the pressure of the reaction system when gas is not recycled to the system.

4,593,123

PROCESS FOR THE PRODUCTION OF ACRYLAMIDE AND METHACRYLAMIDE

Fujio Matsuda, Fujisawa, Japan, assignor to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 70,516, Aug. 28, 1979, abandoned, which is a continuation of Ser. No. 795,283, May 9, 1977, abandoned, which is a continuation of Ser. No. 56,967, Jul. 21, 1970, Pat. No. 4,056,565. This application Nov. 28, 1984, Ser. No. 675,569

Claims priority, application Japan, Jul. 24, 1969, 44-58021; Oct. 9, 1969, 44-80309; Nov. 4, 1969, 44-87593; Nov. 25, 1969, 44-93945

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.[4] C07C *102/08*

U.S. Cl. 564—127 2 Claims

1. In the process for converting an aliphatic nitrile selection from the group consisting of acrylonitrile and methacrylonitrile to the corresponding amide by reacting the aliphatic nitrile with water in the presence of a heterogeneous catalyst, the improvement comprising using a catalytic amount of a catalyst consisting essentially of Raney copper, which is protected from contact with oxygen, the reaction being run at a temperature of about 25° to 200° C., the reaction being carried out in a suspended state, and the reaction being carried out under a pressure which is effective for said reaction to occur, with the proviso that said pressure does not exceed 300 kg/cm^2.

4,593,124

PROCESS FOR PREPARING A MIXTURE OF METHYL- OR ETHYL-SUBSTITUTED PRIMARY ANILINES

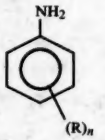
Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 559,183, Dec. 7, 1983, abandoned. This application Sep. 12, 1984, Ser. No. 649,711

Int. Cl.[4] C07C *85/24*

U.S. Cl. 564—409 14 Claims

1. A process for preparing an isomeric mixture of an alkyl-substituted aniline having the formula



I

wherein R is a methyl or ethyl group, n is 1 or 2 when R is methyl, and n is 1 when R is ethyl, the process consisting essentially of contacting at least one compound of formula I with a zeolite catalyst at a temperature of from about 250° to 500° C. and at a pressure of from about 10 kPa to 10 MPa, said zeolite catalyst having pores with dimensions of from about 0.5 nm to less than about 0.7 nm and having cages with dimensions no greater than about 0.7 nm, with the proviso that when R is methyl and n=2 the formula I anilines can only be 2,4-, 2,5- and 3,4-dimethylanilines.

4,593,125

ACYLATION OF NAPHTHALENES

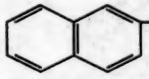
Kenneth G. Davenport, and H. Clay Linstid, III, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 13, 1985, Ser. No. 711,344

Int. Cl.[4] C07C *45/46*

U.S. Cl. 568—319 10 Claims

1. A method for the acylation of a naphthalene compound of the formula:



wherein R is an ortho-para directing electron-donating group not reactive with hydrogen fluoride, with an acylating agent which comprises contacting a reaction mixture of the naphthalene compound and the acylating agent with substantially anhydrous hydrogen fluoride at from about 40° to about 100° C. for a time sufficient to cause substantially complete acylation of the naphthalene compound to the 6-acylnaphthalene compound and isolating the product therefrom.

4,593,126

PROCESS FOR PREPARING ALDEHYDES

Boy Cornils, Dinslaken; Werner Konkol, Oberhausen; Hanswilhelm Bach, Duisburg; Georg Dambkes, Dinslaken; Wilhelm Gick, Duisburg; Wolfgang Greb, Dinslaken; Ernst Wiebus, Oberhausen, and Helmut Bahrmann, Hunxe, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,754

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413427

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 13 Claims

1. In a process for preparing aldehydes by reacting an olefin with carbon monoxide and hydrogen in the presence of water, a rhodium catalyst soluble in the aqueous reaction phase and a water-soluble catalyst complexing agent, said reaction takes place in a liquid phase, said water giving rise to an aqueous phase, the improvement comprising maintaining the pH of said aqueous phase in the range of about 5.5 to about 6.2.

4,593,127

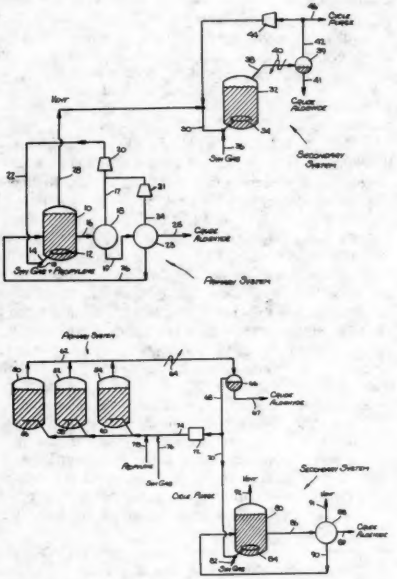
HYDROFORMYLATION PROCESS

Donald L. Bunning, South Charleston, and Michael A. Blessing, Sissonville, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 11, 1985, Ser. No. 690,912

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 24 Claims



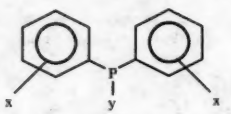
1. In a primary liquid recycle or gas recycle rhodium-catalyzed hydroformylation process for producing aldehydes, wherein an olefin, carbon monoxide and hydrogen are reacted in the presence of a solubilized rhodium-phosphorus complex catalyst, free phosphorus ligand and higher boiling aldehyde condensation by-products to produce an aldehyde product, wherein a gaseous effluent comprising unreacted olefin and any of said aldehyde product, hydrogen, carbn monoxide and an alkane by-product is vented from the process, the improvement which comprises: conducting a decoupled secondary liquid recycle or gas recycle rhodium-catalyzed hydroformylation process conjointly with said primary process, wherein said gaseous effluent together with make-up carbon monoxide and hydrogen is employed as the reactant feed to the secondary process.

4,593,128
STABILIZED POLYHYDROXYBUTADIENE COMPOUNDS

Harry R. Hinney, Springfield, and John R. Murphy, Wayne, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 7, 1984, Ser. No. 648,844
Int. Cl.[4] C07C *29/64*; C08K *5/50*
U.S. Cl. 568—701 **6 Claims**

1. A method for the storage stabilization of liquid or flowable semi-solid polyhydroxybutadiene compounds against changes in reactivity with isocyanate compounds to prepare urethanes which consists essentially of incorporating in said polyhydroxybutadiene from about 0.2 to 5.0 percent by weight of a di- or triphenylphosphine compound having the formula



wherein each x is independently hydrogen, a halogen or an alkyl or alkoxy group having from 1 to 10 carbon atoms and y is an alkyl group having from 1 to 10 carbon atoms or an aryl group which may be substituted with a halogen or an alkyl or alkoxy group having from 1 to 10 carbon atoms.

4,593,129
POLYPHOSPHAZENE PROCESS

R. Woodrow Wilson, Jr., and Dustin H. Thomas, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 18, 1984, Ser. No. 601,505
Int. Cl.[4] C07C *2/56*
U.S. Cl. 568—716 **12 Claims**

1. A process for making a mixture of (i) a sodium alkoxide of a halogen-substituted alcohol containing up to 20 carbon atoms and up to 41 halogen atoms and (ii) a sodium aryloxide wherein said aryloxide is selected from phenoxide, substituted phenoxide wherein the substituents are selected from alkyl, alkoxy, halogen, nitro and allyl, and naphthoxide without excessive reaction of sodium with the halogen substituents, said process comprising:

(a) dispersing about 1 equivalent of molten metallic sodium in a cycloalkane hydrocarbon having about 5–8 carbon atoms and containing about 0.05–0.2 moles of a phenol selected from phenol, substituted phenols wherein the substituents are selected from alkyl, alkoxy, halogen, nitro and allyl, and naphthol at a pressure high enough to maintain said cycloalkane in the liquid phase above the melting temperature of sodium,

(b) cooling the resultant sodium dispersion to a temperature below the melting point of sodium and

(c) adding said resultant sodium dispersion to a solution of said halogen-substituted alcohol in an ether solvent at a rate such that there is not a large amount of unreacted sodium in the halogen-substituted alcohol at any time and at a temperature of about −30° C. up to reflux, the amount of said halogen-substituted alcohol being sufficient to react with at least 90 weight percent of the metallic sodium in said resultant sodium dispersion.

4,593,130
SYNTHESIS OF 10-HYDROXYMETHYL-9-ANTHRALDEHYDE

Donald J. Casey, Ridgefield, Conn., and William J. Trzaskos, Belcamp, Md., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 748,287
Int. Cl.[4] C07C *45/58*
U.S. Cl. 568—427 **4 Claims**

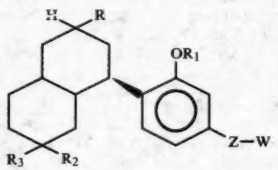
1. The process of preparing 10-hydroxymethyl-9-anthraldehyde which comprises rearranging trans-dispiro(oxirane-2,9-(10'H)-anthracene)10', 2''-oxirane in the presence of a catalytic amount of an acidic ion exchange resin in an inert organic solvent at from about 50° C. to about 100° C. for a period of time sufficient for the rearrangement of a substantial proportion of the starting material.

4,593,131
PHARMACOLOGICALLY ACTIVE 4-[2-HYDROXY-4-(SUBSTITUTED)PHENYL]NAPHTHALEN-2(1H)-ONES AND 2-OLS, DERIVATIVES THEREOF AND INTERMEDIATES THEREFOR

Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 326,952, Dec. 2, 1981, Pat. No. 4,486,609, which is a division of Ser. No. 244,435, Mar. 16, 1981, Pat. No. 4,331,602, which is a division of Ser. No. 189,402, Sep. 19, 1980, Pat. No. 4,285,867. This application Sep. 17, 1984, Ser. No. 651,541
Int. Cl.[4] C07C *41/00, 43/02*
U.S. Cl. 568—632 **12 Claims**

1. A compound having the formula



wherein

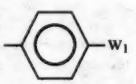
R is hydroxy or alkanoyloxy having from one to five carbon atoms;

R_1 is hydrogen, benzyl or R_1' wherein R_1' is alkanoyl having from one to five carbon atoms, P(O) $(OH)_2$ and mono- and disodium and potassium salts thereof, $—CO(CH_2)_2COOH$ and the sodium and potassium salts thereof;

R_2 when taken individually is hydrogen;

R_3 when taken individually is hydrogen, methyl, hydroxy or $—OR_1$;

W is hydrogen, pyridyl, or



wherein W_1 is hydrogen, chloro or fluoro;

when W is hydrogen, Z is

(a) alkylene having from five to thirteen carbon atoms; or

(b) $—(alk_1)_m—O—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to thirteen carbon atoms; each of m and n is 0 or 1; with the provisos that the summation of carbon atoms in (alk_1) plus (alk_2) is not less than five or greater than thirteen; and at least one of m and n is 1;

when W is other than hydrogen, Z is

(a) alkylene having from three to eight carbon atoms; or

(b) $—(alk_1)_m—O—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to eight carbon atoms; each of m an n is 0 or 1; with the provisos that the summation of carbon atoms in (alk_1) plus (alk_2) is not less than three or greater than eight; and at least one of m and n is 1; or a pharmaceutically acceptable acid addition salt of those compounds wherein W is pyridyl.

4,593,132

PROCESS FOR PRODUCING A GRAPHITE FLUORIDE

Yasushi Kita; Hishaji Nakano; Shiro Moroi, and Akira Sakanoue, all of Ube, Japan, assignors to Central Glass Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 388,633, Jun. 15, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 659,049
Claims priority, application Japan, Jul. 22, 1981, 56-114849
Int. Cl.[4] C07C *17/00*
U.S. Cl. 570—150 7 Claims

1. A process for producing a graphite fluoride, which comprises the steps of:

(1) reacting a carbon material having an average size of 100 μm to 10 mm with fluorine;

(2) terminating the reaction prior to full completion thereof to form a graphite fluoride product comprised of a graphite fluoride and an unreacted carbon material, said graphite fluoride being brittle and present over the unreacted carbon material; and

(3) subjecting the graphite fluoride product to sifting with a sieve of 150 to 400 mesh (Tyler) while applying impact to the graphite fluoride product by means of soft balls or blocks to recover the graphite fluoride from the unreacted carbon material.

4,593,133

ZEOLITE L

Theodorus M. Wortel, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 493,688, May 11, 1983, Pat. No. 4,544,539. This application Apr. 18, 1985, Ser. No. 724,673
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—415 14 Claims

1. A process for the aromatization of non-aromatic hydrocarbons in which the hydrocarbons are contacted with a catalyst comprising a catalytically active metal on a catalyst base, the catalyst base comprising a zeolite having an X-ray diffraction pattern obtained from CuKα radiation with the significant d values set out in Table A hereinbefore and comprising highly crystalline crystallites having at least 50% of its crystallites in the form of distinct circular cylinders with an aspect ratio of at least 0.5 with a mean diameter of at least 0.5 micron.

4,593,134

PROCESS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 449,908, Dec. 15, 1982, Pat. No. 4,504,594. This application Sep. 14, 1984, Ser. No. 650,394
Int. Cl.[4] C07C *15/00*
U.S. Cl. 585—445 6 Claims

1. In a process of dehydrogenating para-ethyltoluene to selectively form para-methylstyrene comprising contacting the para-ethyltoluene under dehydrogenation reaction conditions with a catalyst composition comprising:

(a) from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;

(b) from about 13% to 48% by weight of a potassium compound, calculated as potassium oxide; and

(c) from about 0% to 5% by weight of a chromium compound, calculated as chromic oxide,

the improvement comprising dehydrogenating the para-ethyltoluene with a catalyst composition comprising, in addition to the components (a), (b) and (c), a modifying component (d) capable of rendering the para-methylstyrene-containing dehydrogenation reaction effluent especially resistant to the subsequent formation of popcorn polymers when the dehydrogenation of para-ethyltoluene is conducted over the modified catalyst, the modifying component (d) being a bismuth compound present to the extent of from about 1% to 20% by weight of the catalyst composition, calculated as bismuth trioxide.

4,593,135

METHOD FOR PROMOTING THE ACTIVITY AND/OR EXTENDING THE LIFE OF CATION-EXCHANGEABLE LAYERED CLAY CATALYSTS IN PROTON-CATALYZED REACTIONS

Reginald Gregory, Camberley, England, assignor to The British Petroleum Company P.L.C., London, England

Division of Ser. No. 408,036, Aug. 13, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,314
Claims priority, application United Kingdom, Aug. 21, 1981, 8125547
Int. Cl.[4] C07C *2/66, 41/03, 41/05, 67/04, 67/26*
U.S. Cl. 585—446 15 Claims

1. A method for carrying out a reaction susceptible to catalysis by protons which method comprises contacting the reactants in the presence of a cation-exchangeable layered clay selected from the group consisting of smectites and vermiculites catalyst to which water is added as the sole additive thereby promoting or extending the activity of the catalyst.

11. A process according to any one of claims 1 to 3 wherein the reaction susceptible to cataysis by protons is the production of an alkyl aromatic compound by reacting an aromatic hydrocarbon either with an olefin or a C_2 or higher alcohol.

4,593,136

ZSM-5/ZSM-12 CATALYST MIXTURE FOR CRACKING ALKYLBENZENES

Warren W. Kaeding, Lawrenceville, and Carol S. Lee, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 620,590, Jun. 14, 1984, which is a continuation-in-part of Ser. No. 490,624, May 2, 1983, abandoned. This application Oct. 7, 1985, Ser. No. 784,965
Int. Cl.[4] C07C *2/64, 4/12*
U.S. Cl. 585—446 4 Claims

1. In a method for the preparation of isopropylbenzene from benzene and a mixture of propane and propylene, wherein a heavy aromatic bottoms fraction is produced as a byproduct, said bottoms fraction consisting essentially of hydrocarbons having 10 or more carbon atoms, the improvement comprising cracking said bottoms fraction over a catalyst comprising a mixture of zeolites, said mixture comprising:

(i) from about 10% to about 90% by weight of ZSM-5; and

(ii) from about 10% to about 90% by weight of ZSM-12.

4,593,137

PARA-SELECTIVE AND BETA-SELECTIVE CRYSTALLIZED GLASS ZEOLITE ALKYLATION CATALYST

Dan Fraenkel; Moshe Levy, and Margaret Cherniavsky, all of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Mar. 23, 1984, Ser. No. 592,795
Claims priority, application Israel, Mar. 30, 1983, 68265
Int. Cl.[4] C07C *2/68*
U.S. Cl. 585—467 9 Claims

1. A method for the selective alkylation of toluene to p-alkyl toluene comprising alkylating toluene with a C_1–C_3-alkanol in the presence of a crystallized borosilicate glass zeolite alkylation catalyst para-selective in the alkylation of benzene or derivatives thereof and beta-selective in the alkylation of naphthalene or derivatives thereof.

4,593,138

CATALYTIC ISOMERISATION PROCESS EMPLOYING ZEOLITE EU-1

John L. Casci, Redcar; Barrie M. Lowe, Edinburgh, and Thomas V. Whittam, Darlington, all of England, assignors to Imperial Chemical Industries Plc, London, England

Division of Ser. No. 272,465, Jun. 11, 1981, Pat. No. 4,537,754. This application Jun. 14, 1985, Ser. No. 744,638

Claims priority, application United Kingdom, Jun. 12, 1980, 8019210

Int. Cl.[4] C07C *5/22*

U.S. Cl. 585—481 8 Claims

1. A catalytic process for the isomerisation of aromatic hydrocarbons employing a catalyst comprising zeolite EU-1 having a molar composition expressed by the formula:

$$0.5 \text{ to } 1.5\ R_2O:Y_2O_3:\text{at least } 10\ XO_2:0 \text{ to } 100\ H_2O$$

wherein R is a monovalent cation or 1/n of a cation of valency n, X is silicon and/or germanium, Y is one or more of aluminum, iron, gallium or boron, and H_2O is water of hydration additional to water notionally present when R is H, and having, when freshly prepared, an X-ray deffraction pattern as shown in Table 1, wherein

said method comprises the step of contacting said catalyst, under isomerisation conditions, with a feedstock which includes said aromatic hydrocarbons.

4,593,139

METHANE CONVERSION

Howard P. Withers, Douglassville, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 600,669, Apr. 16, 1984, Pat. No. 4,489,215. This application Oct. 31, 1984, Ser. No. 666,700

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 9 Claims

1. A method for converting methane to higher hydrocarbon products which comprises contacting at a temperature within the range of about 500°–1000° C. a gas comprising methane and a solid comprising a reducible oxide of Ru.

4,593,140

PROCESS FOR DIMERIZING CONJUGATED DIENES

André Mortreux, Hem; Francis Petit, Wasquehal; Philippe Denis, Villeneuve D'Ascq; Gérard Buono, and Gilbert Peiffer, both of Marseilles, all of France, assignors to Societe Chimique des Charbonnages S.A., Paris, France

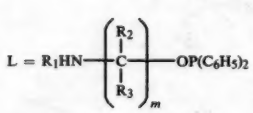
Filed May 10, 1985, Ser. No. 732,544

Claims priority, application France, May 10, 1984, 84 07189; Mar. 13, 1985, 85 03671

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—508 14 Claims

1. Process for dimerization of a conjugated diene in the presence of a catalyst containing zerovalent nickel and a phosphorus compound, wherein the said catalyst is obtained by bringing together (A) at least one nickel complex of formula NiZ_q in which q is the coordination number of the nickel and Z is at least one ligand capable of complexing nickel and (B) at least one phosphorus-containing ligand of general formula



in which:

R_1 is chosen from a hydrogen atom and hydrocarbon radicals,

R_2 and R_3, which may be identical or different, are chosen from a hydrogen atom and hydrocarbon radicals optionally bearing at least one group chosen from alcohol, thiol, thioether, amine, imine, acid, ester, amide and ether groups, and

m is greater than or equal to 1.

4,593,141

HYDROFORMYLATION CATALYSIS BY BRANCHED ALKYL DIARYL PHOSPHINE RHODIUM COMPLEXES

Alexis A. Oswald, Mountainside, N.J.; Torris G. Jermansen, Staten Island, N.Y.; Andrew A. Westner, Paramus, and I-Der Huang, Upper Saddle River, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 407,050, Aug. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 120,971, Feb. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 11,238, Feb. 12, 1979, Pat. No. 4,298,541. This application Jul. 18, 1985, Ser. No. 756,564

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 15 Claims

1. In a process for the hydroformylation of a C_3 to C_{40} aliphatic, unsubstituted monoolefin to produce an aldehyde having one more carbon atom than the olefin comprising reacting said olefin with hydrogen and carbon monoxide in a liquid reaction medium which contains a β, β'-branched alkylene bis-phosphine rhodium carbonyl hydride complex catalyst and excess β,β'-branched alkylene bisphosphine ligand and wherein the hydroformylation reaction conditions are controlled to a temperature of from about 50° to about 200° C., a total gas pressure of hydrogen, carbon monoxide and olefin of about 16 to about 1015 psia, a carbon monoxide partial pressure of less than 215 psia, a hydrogen partial pressure of about 65 to about 515 psia, and ligand/rhodium molar ratio of about 40 to 3,000, the improvement comprising improving the stability of said catalyst against deactivation by employing said phosphine ligand in excess.

4,593,142

METHODS OF ALKOXYLATION

Kang Yang, Ponca City, Okla., assignor to Vista Chemical Company, Houston, Tex.

Division of Ser. No. 422,324, Sep. 23, 1982, Pat. No. 4,456,697. This application Feb. 21, 1984, Ser. No. 581,633

Int. Cl.[4] C07C *41/03, 43/11, 43/184, 43/205*

U.S. Cl. 568—618 20 Claims

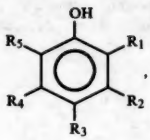
11. In a method for the alkoxylation of an alkoxylate precursor selected from the group consisting of the alcohols of the general formulae

(A) ROH, wherein R is a linear or branched alkyl group containing from 1 to 30 carbon atoms, an aryl or cyclic group containing from 6 to 30 carbon atoms, or an olefinic or acetylenic group containing from 2 to 30 carbon atoms, and wherein said groups are unsubstituted or substituted.

(B)

wherein R_1, R_2 and R_3 are, independently, linear or branched acyclic groups, alicyclic groups, cyclic groups, or aryl groups or hydrogen, and wherein said groups are unsubstituted or substituted and these polyhydric alcohols contain from 2 to 30 carbon atoms, and

(C)



wherein R_1, R_2, R_3, R_4 and R_5 are, independently, linear or branched acyclic groups, alicyclic groups, cyclic groups, or aryl groups or hydrogen, and wherein said groups are unsubstituted or substituted and these phenols contain from 6 to 30 carbon atoms,

with an alkoxylating agent selected from the group consisting of the alpha and beta alkylene oxides

under alkoxylating conditions at a temperature between about 20° C. and about 260° C., at a pressure up to about 100 psig and for a time sufficient to alkoxylate to the extent desired,

the improvement comprising:

conducting said alkoxylation in the presence of a catalyst system comprising hydrogen fluoride and at least one metal alkoxide of the general formula $M(OC_nH_{2n+1})_q$, wherein M is selected from the group consisting of aluminum, gallium, indium, thallium, zirconium, hafnium and titanium, q is the valence of M and n is a number between 1 and 22;

maintaining the mole ratio of hydrogen fluoride to metal alkoxide between about 0.1 and about 10.0; and

maintaining said catalyst system present in an amount of about 0.05 to about 10.0 weight percent relative to the combined weight of said alkoxylate precursor and said alkoxylating agent.

4,593,143

HYDROXYALKOXY NORBORNYL ETHERS

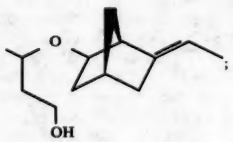
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

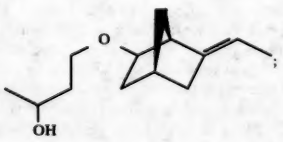
Continuation-in-part of Ser. No. 574,150, Jan. 26, 1984, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, Pat. No. 4,532,364, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,013

Int. Cl.[4] **C07C** *43/196, 41/06*

U.S. Cl. 568—665 **1 Claim**

1. A mixture of compounds having the structures:





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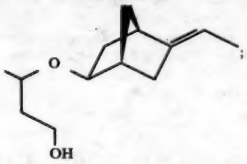
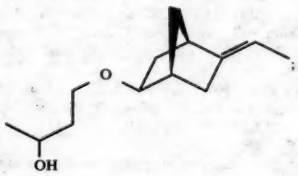
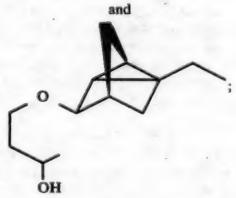
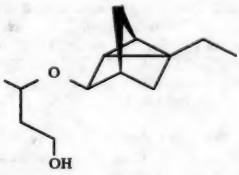
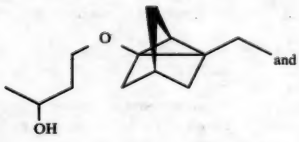




and







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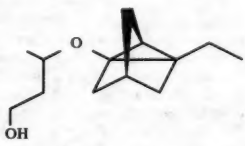
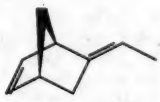
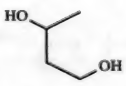


produced according to the process of reacting ethylidene norbornene having the structure:



with 1,3-dihydroxy butane having the structure:



in the presence of a mineral acid catalyst or a Lewis acid catalyst at a temperature in the range of from about 25° C. up to about 120° C., the mole ratio of acid catalyst to ethylidene norbornene varying from about 1:99 up to about 1:10; the mole ratio of ethylidene norbornene:1,3-butanediol varying from about 1:1 up to about 1:2 and then recovering said mixture by means of fractional distillation.

4,593,144

PROCESS FOR PREPARING SUBSTITUTED BENZOTRICHLORIDE COMPOUNDS

John P. Chupp, Kirkwood, and Thomas E. Neumann, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 572,775, Jan. 23, 1984, abandoned. This application Oct. 10, 1984, Ser. No. 659,393

Int. Cl.[4] C07C *79/10, 19/08, 17/00, 21/18*

U.S. Cl. 568—936 **15 Claims**

8. A process for the preparation of nuclear substituted benzotrichlorides which comprises reacting a nuclear substituted benzyl chloride with a C_{1-3} perchloroalkane in the presence of base and a phase transfer catalyst, said benzyl chloride having at least one electron withdrawing nuclear substituent being sufficiently electron withdrawing to make the benzyl chloride reactive with the C_1—perchloroalkane.

4,593,145

PROCESS FOR PRODUCING ISOPRENE

Yoichi Ninagawa, Matsudo; Osamu Yamada; Tsumoru Renge, both of Hasaki; Sunao Kyo, Abiko; Takayoshi Osaki, Kurashiki, and Koichi Kushida, Ibaraki, all of Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

Continuation-in-part of Ser. No. 540,870, Oct. 11, 1983. This application Mar. 4, 1985, Ser. No. 707,842

Claims priority, application Japan, Oct. 14, 1982, 57-180759

Int. Cl.[4] C07C *1/20*

U.S. Cl. 585—607 **16 Claims**

1. A process for producing isoprene by reacting an alkyl tertiary butyl ether with formaldehyde in an acidic aqueous solution, characterized in:

(a) that the acidic aqueous solution is present in the reaction zone,

(b) that said alkyl tertiary butyl ether, a formaldehyde source and water are fed to said reaction zone continuously or intermittently, and

(c) that isoprene, water, unreacted starting materials, isobutene, tertiary butanol and other low-boiling components are distilled off from said reaction zone,

the amounts of said alkyl tertiary butyl ether and formaldehyde source being fed to said reaction zone being such that the alkyl tertiary butyl ether-to-formaldehyde molar ratio in the charge is at least 2 and the pressure in the reaction system being maintained at a level 1.2 to 3.5 times the vapor pressure at the reaction temperature of the acidic aqueous solution existing in the reaction zone, said alkyl tertiary butyl ether-to-formaldehyde molar ratio being calculated by calculating the amount of the formaldehyde source in formaldehyde equivalent when said source is other than formaldehyde.

4,593,146

ISOMERIZATION PROCESS AND CATALYST THEREFOR

Marvin M. Johnson; Gerhard P. Nowack, and Max P. McDaniel, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 29, 1985, Ser. No. 718,241

Int. Cl.[4] C07C *5/25*

U.S. Cl. 585—667 **7 Claims**

1. A process for the double bond isomerization of an aliphatic olefinic hydrocarbon feed which comprises contacting said feed under isomerization conditions with a catalyst consisting essentially of:

(a) 0.1–10 wt.% of elemental chromium or a chromium compound, calculated as chromium metal and based on the total weight of chromium and support, and

(b) an aluminum phosphate support wherein the phosphorus-/aluminum atomic ratio of said support is less than one.

4,593,147

SYNTHESIS OF NEOALKANES

Stephen A. Butter, Allentown, and Ilse Stoll, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 1, 1984, Ser. No. 667,173

Int. Cl.[4] C07C *1/00*

U.S. Cl. 585—733 **28 Claims**

1. In a process for the synthesis of an alkyl-substituted 1,1,1-trialkylalkane of the formula $R_1R_2R_3CCH_3$ by hydrogenation, wherein R_1, R_2 and R_3 are the same or different alkyl of 1–10 carbon atoms in the presence of a hydrogenation catalyst and hydrogen, the improvement which comprises hydrogenating a feed of a neoacid of the formula $R_1R_2R_3CCOOH$, at a temperature from about 325° C. to about 375° C.; a hydrogen feed rate of 1500 to 8000 ml/g catalyst/h; a neoacid feed rate of 0.2 to 4.9 mM/g catalyst/h and a hydrogen pressure of 35–140 Kg/cm^2 over a copper oxide/zinc oxide catalyst comprising 80–95% by wt. of copper oxide/zinc oxide in an 8:1 to 1:1 weight ratio and 20–5% by weight alumina to obtain substantially complete conversion of the neoacid and recovering a product containing at least about 15 mol % yield of neoalkane based on the neoacid feed.

4,593,148

PROCESS FOR REMOVAL OF ARSINE IMPURITIES FROM GASES CONTAINING ARSINE AND HYDROGEN SULFIDE

Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 25, 1985, Ser. No. 715,549

Int. Cl.[4] C07C *7/12;* C01B *3/00;* C10G *65/06, 61/06*

U.S. Cl. 585—823 **25 Claims**

1. A process for removing arsine impurities from a gaseous stream comprising the step of (A) contacting said stream, which contains at least one arsine and also hydrogen sulfide, with a sorbent composition comprising (a) CuO and (b) ZnO, under such conditions as will result in a stream having a reduced content of arsine, wherein the weight ratio of CuO to ZnO in said sorbent composition is in the range of from about 20:1 to about 1:20.

18. A process for treating an olefin containing feed stream comprising the steps of

(A) contacting the olefin containing hydrocarbon feed stream, which also contains arsine and H_2S, with a sorbent material comprising (a) CuO and (b) ZnO, under such conditions as will result in an intermediate hydrocarbon stream having a reduced arsine content, wherein the sorbent composition has been prepared by a method comprising the steps of coprecipitating hydroxides of copper and zinc and then calcining the hydroxides so as to substantially convert them to CuO and ZnO and wherein the weight ratio of CuO to ZnO in said sorbent composition is in the range of from about 20:1 to about 1:20; and

(B) contacting at least a portion of said intermediate hydrocarbon stream with hydrogen and a noble metal hydrogenation catalyst at hydrogenation conditions so as to substantially hydrogenate said olefins present in said intermediate stream.

4,593,149

PROCESS FOR SEPARATING ETHYLBENZENE FROM XYLENES BY SELECTIVE ADSORPTION ON A CESIUM SUBSTITUTED X ZEOLITE

Denise M. Barthomeuf, Lyons, France, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 29, 1984, Ser. No. 666,193
Int. Cl.[4] C10C 7/13
U.S. Cl. 585—828 17 Claims

1. A process for the separation of ethylbenzene from a feedstream containing ethylbenzene and at least one xylene isomer comprising the steps of:

(a) contacting the feedstream with a Cs exchanged Type X zeolite under conditions for adsorbing ethylbenzene by the zeolite,

(b) passing a desorbent selected from the group consisting of n-propylbenzene, n-butylbenzene, n-pentylbenzene, n-heptylbenzene, n-nonylbenzene, isobutylbenzene, m-diethylbenzene, o-methyl-n-propylbenzene, and p-methyl-n-propylbenzene through the zeolite during and after the contacting step,

(c) recovering a stream enhanced in ethylbenzene content from the zeolite.

4,593,150

PROCESS FOR ENHANCING THE SEPARATION OF PARAXYLENE FROM A FEEDSTREAM CONTAINING OTHER XYLENES AND ETHYLBENZENE USING A ZEOLITE ADSORBENT

Denise M. Barthomeuf, Lyons, France, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 23, 1984, Ser. No. 674,187
Int. Cl.[4] C10C 7/13
U.S. Cl. 585—828 24 Claims

1. A process for separating paraxylene from a stream containing paraxylene and at least one other C_8-aromatic comprising the steps of:

(a) contacting the stream with a potassium substituted Type Y zeolite under conditions for effecting the selective adsorption of the paraxylene by the zeolite;

(b) passing through the zeolite, before, during or after the contacting step, a cyclic nitrogen-containing additive; and

(c) recovering from the zeolite a stream enhanced in concentration of paraxylene relative to the other C_8-aromatic.

4,593,151

PHOTOELECTRIC CONVERSION DEVICE

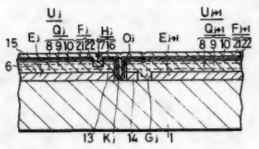
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 620,171, Jun. 13, 1984, which is a division of Ser. No. 554,807, Nov. 23, 1983, Pat. No. 4,527,006. This application Jul. 31, 1985, Ser. No. 760,957

Claims priority, application Japan, Nov. 24, 1982, 57-206809; Nov. 24, 1982, 57-206806; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-2044443

Int. Cl.[4] H01L *27/14, 31/06*

U.S. Cl. 136—244 **10 Claims**



1. A photoelectric conversion device comprising:

a substrate having an insulating surface; and

a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed thereon side by side and connected in series one after another:

wherein the semiconductor element U_i (i=1, 2, 3, . . . n)has a first electrode E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electrode E_i and having formed therein at least one semiconductor junction, and a second electrode F_i formed on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;

wherein the first electrodes E_j and E_{j+1} (j=1, 2, . . . (n−1) are separated by a first groove G_j;

wherein the second electrode F_{j+1} of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semiconductor element U_j through a coupling portion K_j formed by an extension of the second electrode F_{j+1} and extending into a second groove O_j formed in the non-single-crystal semiconductor laminate member Q_j and spaced from the first groove G_j; and

wherein the second electrodes F_j and F_{j+1} are separated by an isolating portion H_j, the isolating portion H_j comprising a third groove opposite the first electrode E_j but spaced from the second groove O_j and extending to the semiconductor laminate member Q_j, and an oxidized portion of the non-single-crystal semiconductor laminate member Q_j which forms the lower surface of the third groove.

4,593,152

PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,763

Claims priority, application Japan, Nov. 24, 1982, 57-206806; Nov. 24, 1982, 57-206809; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-204443

Int. Cl.[4] H01L *31/06, 27/14*

U.S. Cl. 136—246 **28 Claims**

1. A photoelectric conversion device comprising:

a substrate having an insulating surface; and

a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed thereon side by side and connected in series one after another;

wherein the semiconductor element U_i (i=1, 2, 3, . . . n) has a first electrode E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electrode E_i and a second electrode F_i formed on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;

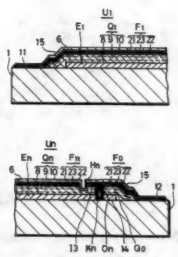
wherein the non-single-crystal semiconductor laminate member Q_i has at least (a) a first non-single-crystal semiconductor layer of a first conductivity type making contact with the first electrode E_i and (b) a second non-single-crystal semiconductor layer of a second conductivity type making contact with the second electrode F_i;

wherein the second electrode F_{j+1} (j=1, 2, . . . (n−1)) of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semiconductor element U_j through a coupling portion Kj formed by an extension of the second electrode F_{j+1};

wherein the first electrode E_i has at least a first conductive metal oxide layer which contacts the first non-single-crystal semiconductor layer;

wherein the second electrode F_i and the coupling portion K_j each has at least (a) a second conductive metal oxide layer which contacts with the second non-single-crystal semiconductor layer and (b) a conductive material layer disposed on the second conductive metal oxide layer;

wherein the first conductive metal oxide layer of the first



electrode E_i is formed of indium oxide or a material consisting principally thereof in the case where the first conductivity type of the first non-single-crystal semiconductor layer is the N-type, or of tin oxide or a material consisting principally thereof in the case where the first conductivity type of the first non-single-crystal semiconductor is the P-type;

wherein the second conductive metal oxide layer of the second electrode F_i and the coupling portion K_j are formed of tin oxide or a material consisting principally thereof in the case where the second conductivity type of the second non-single-crystal semiconductor layer is the P-type, or of indium oxide or a material consisting principally thereof in the case where the second conductivity type of the second non-single-crystal semiconductor layer is the N-type;

wherein a portion of the non-single-crystal semiconductor laminate member Q_1 extends onto the substrate from the first electrode E_1; and

wherein a portion of the second electrode F_1 extends as a external connection terminal onto the substrate extending from the extending portion of the non-single-crystal semiconductor laminate member Q_1.

4,593,153
POWER TRANSMISSION CABLE, SUCH AS LOUDSPEAKER CABLE

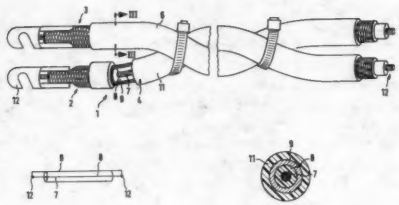
Volker Kühn, and Thomas Kühn, both of Malsch, Fed. Rep. of Germany, assignors to Audioplan Renate Kuhn, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,240

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337433

Int. Cl.[4] H01B *11/02, 11/18*

U.S. Cl. 174—34 **6 Claims**



1. A power transmission cable, such as a loudspeaker cable for connecting a loudspeaker to an amplifier, with two conductors and associated connecting elements, wherein each conductor comprises an internal partial conductor and at least one external coaxial partial conductor surrounding the internal partial conductor, the internal partial conductor and the at least one external coaxial partial conductor being electrically insulated from one another over the length of the cable, the internal partial conductor and the at least one external coaxial partial conductor being electrically interconnected at their respective ends at the vicinity of the associated connecting elements.

4,593,154
LOOP-TYPE DATA TRANSMISSION/RECEPTION NETWORK

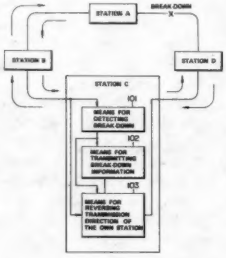
Hitoshi Takeda; Norimasa Kishi; Tadashi Suzuki, all of Yokohama; Minoru Tomikashi, Zushi, and Tooru Futami, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 28, 1984, Ser. No. 625,432

Claims priority, application Japan, Jul. 8, 1983, 58-124350; Jul. 11, 1983, 58-125830

Int. Cl.[4] H04L *11/15*

U.S. Cl. 178—2 D **11 Claims**



1. A loop-type data transmission/reception network system having a plurality of data processing stations and a single data transmission/reception route which interconnects said stations in a loop for transmitting necessary data between said stations in a first predetermined direction, each of said data processing stations comprising:

(a) means for detecting break-downs in said data transmission/reception route between such station itself and an adjoining station in a second direction opposite to said first direction in which the data is normally transmitted;

(b) means responsive to the detection of break-down in the data transmission/reception route between such station itself and said adjoining station by the detection means for transmitting the break-down information to a second adjoining station in said first predetermined direction; and

(c) means for transmitting information on a reversal of the transmission direction in such station itself via the data transmission/reception route to the second adjoining station together with the break-down information transmitted by said break-down transmitting means before such station itself reverses the transmission direction thereof.

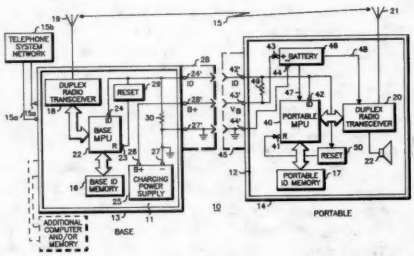
4,593,155
PORTABLE TELEPHONE ID CODE TRANSFER SYSTEM

George C. Hawkins, Barrington, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 558,738, Dec. 5, 1983. This application Oct. 11, 1985, Ser. No. 786,365

Int. Cl.[4] H04Q *7/04*

U.S. Cl. 179—2 EA **36 Claims**



1. A communication system comprising;

at least one base unit having a housing and a predetermined associated base ID (identification) code stored therein, and

at least one portable unit having a housing separable from said base unit housing and having an associated portable ID code storable therin,

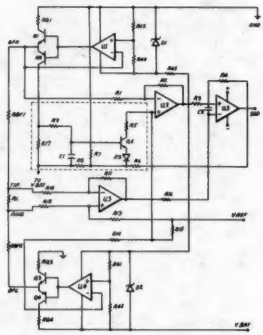
said base and portable units capable of establishing desired information communication therebetween on a communication link in response to circuitry in at least one of the base and portable units determining that the base and portable ID codes stored in the base and portable units, respectively, have the proper correspondence to one another,

the portable unit including therein learning and storing means for learning said associated portable ID code from said base unit in response to a predetermined connection being provided between said portable and base units, said portable unit learning and storing means storing said learned portable ID code in said portable unit, said base unit including therein code transmitting means for transmitting to said portable unit learning and storing means, in response to providing said predetermined connection, code information, determined by said stored base ID code which was stored in said base unit prior to said predetermined connection, which determines said learned and stored portable ID code, said learned and stored portable ID code and said stored base ID code having proper correspondence to one another to permit said desired communication on said communication link.

4,593,156
GROUNDED TIP DETECTOR

Philip T. Martin, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed May 18, 1984, Ser. No. 611,569
Int. Cl.⁴ H04M *3/08*
U.S. Cl. 179—16 AA **5 Claims**



1. A grounded tip detection circuit for a subscriber line interface circuit having a tip lead, comprising:

means for detecting a tip-to-ground condition, and

means responsive to said detecting means for providing an indication of said tip-to-ground condition;

wherein said detecting means comprises;

means, coupled to said tip lead of said subscriber line interface circuit, operated in response to the connection of said tip lead to ground potential to generate a detection signal;

wherein said detection signal generating means comprises;

sensing means coupled to said tip lead and referenced to a battery potential, for sensing the potential at said tip lead, and

a switching means, coupled to said sensing means, operated in response to a said potential sensing to generate said detection signal;

wherein said sensing means comprises a sensing resistor and said switching means comprises a transistor which includes an emitter lead, a base lead, and a collector lead; and

a resistor and capacitor in series combination connected in parallel with said sensing resistor, the point between said resistor and capacitor of said series combination connected to said base lead of said switching means, wherein said series combination provides AC filtering of said sensed tip lead potential.

4,593,157
DIRECTORY INTERFACE AND DIALER

Myron S. Usdan, 27 N. Main St., Chalfont, Pa. 18914

Filed Sep. 4, 1984, Ser. No. 646,839
Int. Cl.⁴ H04M *1/26*
U.S. Cl. 179—90 BD **6 Claims**

1. An information recognition display and dialer for a phone receiver having input and output lines, comprising:

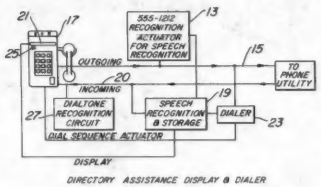
a. a speech recognition and storage means connected to the input lines of said phone receiver;

b. an activator circuit connected to said speech recognition and storage means responsive to a digit sequence connected to the output line of said phone receiver for activating said speech recognition and storage means;

c. a numeric display means connected to said speech recognition and storage means for displaying the digits recognized and stored in said recognition and storage means;

d. dialer means connected to said speech recognition and storage means and to the output lines of said phone receiver for delivering dialing pulses to the output lines of said phone receiver corresponding to the digits recognized and stored in said speech recognition and storage means;

e. a dialer activator located on said phone receiver connected to said dialer means for initiating a dialout function;

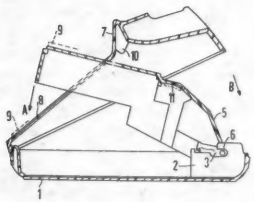


f. a dialtone recognition circuit connected to said phone receiver and said dialer activator which prevents the dialer activator from activating said dialer until a dialtone is recognized.

4,593,158
TELEPHONE SUBSCRIBER STATION WITH A PIVOTABLY ATTACHED CHASSIS AND UPPER HOUSING

Erwin Awakowicz, Munich, and Peter Kleine, Fischen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,088
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311705
Int. Cl.⁴ H04M *1/02*
U.S. Cl. 179—100 R **2 Claims**

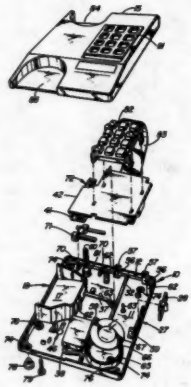


1. In a telephone subscriber station with a lower housing component on which there are a chassis, pivotably mounted for pivoting in one direction and which contains the main components of the subscriber station, and an upper housing component pivotably mounted for front to back pivoting in the opposite direction to the pivoting direction of the chassis, the improvement wherein the upper housing component includes a projection which presses upon a spring-like lug of the chassis and the chassis is provided with an operating array which projects through an opening in the upper housing component when the telephone subscriber station is in a fully assembled state, the chassis being mounted on the lower housing component so that it is displaceable in a horizontal plane of the station in a partially assembled state, the partially assembled state being when the chassis is pivotably mounted into a temporary horizontal position on the lower housing but the upper housing has not been pivotably rotated into position of the fully assembled state.

4,593,159
BASE PLATE FOR TELEPHONE SET BASE

Eugene W. Charchanko, Thorndale; Gerd Kuhfus, and Algirdas J. Dragunevicius, both of London, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 9, 1984, Ser. No. 669,840
Int. Cl.[4] H04M *1/02*
U.S. Cl. 179—100 R 6 Claims

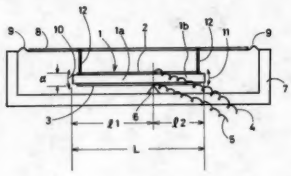


1. A base-plate for a telephone set base, comprising:
a flat rectangular bottom panel;
a peripheral wall extending upwardly from the bottom panel and extending for at least a major part of the periphery of the bottom panel;
an inclined web extending laterally inward from one side edge of the bottom panel, the web extending inwardly and upwardly;
an aperture in the bottom panel aligned with said inclined web;
a wall extending up from said bottom panel around said aperture, said wall extending upward past said inclined web and having an upper edge for cooperation with a top housing of a telephone set base;
said wall extending up from said bottom panel, and said inclined web, defining a lower recess below said inclined web and an upper recess above said inclined web, said upper recess open at said one side edge of said bottom panel;
a further recess extending up through said bottom panel, said further recess bounded on three sides by a continuous wall and closed at a top by a transverse web, said further recess open on a fourth side;
a first enclosed channel in said bottom panel extending from a back end of said bottom panel to said further recess;
a second enclosed channel in said bottom panel extending from a front end of said bottom panel to said further recess;
a third enclosed channel in said bottom panel extending from said lower recess to said first enclosed channel;
support and positioning members extending up from said bottom panel to support and position a circuit board; and
retaining members extending up from said bottom panel for retaining said circuit board in position, said retaining members including at least one deflectable member, said deflectable member deflecting to admit passage of an edge of a circuit board and snapping back over said circuit board.

4,593,160
PIEZOELECTRIC SPEAKER

Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 4, 1985, Ser. No. 707,602
Claims priority, application Japan, Mar. 9, 1984, 59-46230
Int. Cl.[4] H04R *17/00*
U.S. Cl. 179—110 A 9 Claims

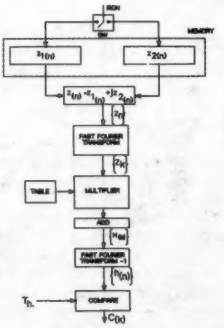


1. A piezoelectric speaker comprising a piezoelectric vibrator for vibrating in a bending mode supported at a longitudinal intermediate position thereof by a support member whereby first and second portions of said piezoelectric vibrator on both sides of said support member are supported in a cantilever manner respectively, said piezoelectric vibrator being connected at portions close to both ends thereof with a diaphragm whereby bending vibration of said piezoelectric vibrator is transferred to said diaphragm thereby to drive said diaphragm,
the position of said support member with respect to said piezoelectric vibrator being so selected that the resonance frequency of said first portion is smaller than the corresponding resonance frequency of said second portion, and the primary resonance frequency of said second portion being so selected as to be substantially at the center value of the primary and secondary frequencies of said first portion on logarithmic coordinates.

4,593,161
METHOD OF INITIALIZING A FILTER IN AN ECHO CANCELLER AND COMMUNICATION SYSTEM USING SAID METHOD

André Desblache, Nice; Claude Galand, Cagnes sur Mer, and Robert Vermot-Gauchy, Saint Paul, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,748
Claims priority, application European Pat. Off., Jun. 30, 1983, 83430023.8
Int. Cl.[4] H04B *3/20*
U.S. Cl. 179—170.2 8 Claims



1. A method for initializing the coefficients of an echo canceler digital filter made to cancel an echo signal within a tele-

phone network including transmitting and receiving sections within an echo signal path, said method being based on fast Fourier transform (FFT) operations operated over echoes due to the transmission of a uniform amplitude spectrum initializing signal over said echo path, and including:

generating said initializing signal;

sampling and digitally encoding said initializing signal to derive a first sequence of digital terms therefrom;

transmitting said first sequence over the transmitting section of said echo path;

collecting and storing a second sequence of terms received over said receiving section;

operating an FFT operation over said second sequence of terms, whereby a third sequence of terms is generated;

operating a phase rotation operation over said third sequence of terms, whereby a fourth sequence of terms is generated;

operating an inverse FFT operation over said fourth sequence, whereby a fifth sequence of terms is generated;

sorting the terms of said fifth sequence to determine the largest term therein;

selecting and measuring a predetermined number of terms of said fifth sequence which are located on both sides of said largest term within the fifth sequence; and,

using the information provided by said sorting and selecting and measuring operations to initialize said digital filter coefficient.

4,593,162

DEVICE FOR CONTROLLING AN ELECTRICAL SIGNAL BY AN ADJUSTABLE PLUG

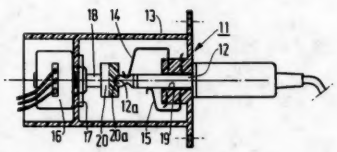
Gérard Rochette, Mantes la Ville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1984, Ser. No. 643,228

Claims priority, application France, Aug. 31, 1983, 83 13987

Int. Cl.⁴ H01H *19/00*

U.S. Cl. 200—51.09 **5 Claims**



1. A device for rotating a shaft, comprising:

a casing forming a cylindrical recess and also forming an opening communicating with the recess;

a cylindrical plug including a free end having parts forming grooves, the plug being disposed within the opening and the recess;

a plurality of contact springs electrically contacting the plug;

an electrical component disposed within the recess, the component having a rotatable shaft coaxial with the plug;

a coupling member fixed on the rotatable shaft, the coupling member having a cavity in which the free end is disposed, the coupling member further having grooves communicating with the cavity, the grooves of the coupling member being engaged by the parts of the free end, so that a rotation of the plug causes a rotation of the rotatable shaft.

4,593,163

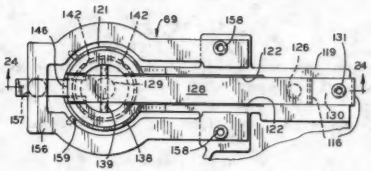
ELECTRIC MOTORS AND METHOD OF MANUFACTURING AND OPERATING SAME

Lynn E. Fisher, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Aug. 12, 1983, Ser. No. 522,620

Int. Cl.⁴ H01H *35/10, 1/00*

U.S. Cl. 200—80 R **12 Claims**



1. In an electric motor winding energization controlling switch assembly comprising a switch arm support, at least two elongate switch arms supported thereon, and at least one contact carried by each of said switch arms, the improvement wherein: said support includes an elongate channel, for accommodating and protecting at least one of said switch arms and further includes an open barrel retainer at one end thereof for receiving a switch actuator; at least one of said switch arms is nested within said elongate channel; the switch arm support includes a switch arm stop surface; one of said switch arms is supported for movement into engagement with said stop surface; the assembly includes a cup shaped actuator disposed within said open barrel retainer; and said actuator has means for maintaining at least two of said switch arms in parallel alignment with one another.

4,593,164

HOUSING OF A VACUUM SWITCHING TUBE

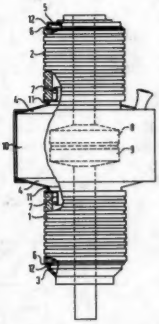
Günter Bialkowski, and Hans Bettge, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 630,967

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325468

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. Housing of a vacuum switching tube containing switch contacts or contact leads, comprising at least one insulator having a given temperature coefficient and a connecting surface, a non-magnetic metal switching chamber surrounding the contacts or contact leads having a temperature coefficient differing from said given temperature coefficient, and a mag-

netic connecting part with a temperature coefficient substantially equal to said given temperature coefficient, said connecting part connecting said metal part to said connecting surface of said insulator with a vacuum-tight joint between said connecting part and said connecting surface of said insulator, said connecting part and metal part having shapes preventing destruction of said vacuum-tight joint under given maximum expected thermal and mechanical stresses, and said connecting part being free of surfaces than can vibrate and transmit vibrations to the environment of the switching tube.

4,593,165

VACUUM SWITCH

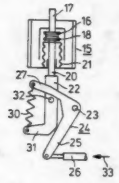
Norbert Steinemer, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,138

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3414016

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B **8 Claims**



1. A vacuum switch with a driving device for switching a vacuum-tight switching tube into on and off positions, the vacuum switch including

a movable connecting pin of the switching tube;

a drive lever of the driving device, the drive lever coupled to a pivot bearing so as to allow the drive lever to swing about the pivot bearing;

a spring having two ends, one end being connected to the connecting pin, the other end being connected to the drive lever;

a stop for limiting the relative motion, in a switching-off direction, of the connecting pin and the drive lever,

wherein the improvement comprises:

the stop being connected to the connecting pin;

an engagement of the spring and the stop with the drive lever yielding lever arms of different lengths as measured from the pivot bearing, the engagement yielding a first lever arm measured from the pivot bearing to the stop, and the engagement yielding a second lever arm measured from the pivot bearing to a point of connection of the spring and the drive lever;

the second lever arm being longer than the first lever arm, and the relative dimensions of the first and second lever arms being such that when the switching tube is in the off position, an opening force, which acts upon the connecting pin, cancels a switching-on closing force, which acts upon the connecting pin and which is caused by ambient air pressure.

4,593,166

DUAL ACTION PRESSURE SWITCH

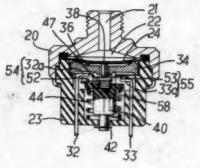
Hisatoshi Hirota, Hachioji, and Toyoyuki Hara, Fuchu, both of Japan, assignors to TGK Company, Limited, Hachioji, Japan

Filed Feb. 6, 1985, Ser. No. 699,152

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—83 J **3 Claims**

1. A dual action pressure switch comprising a casing including an upper casing portion having a center coaxial pressure inlet and a lower casing portion secured to said upper casing portion, a diaphragm pinched at the periphery between said upper and lower casing portions to define a pressure receiving chamber within said upper casing portion in communication with said inlet, a packing sealing between said upper and lower casing portions and said diaphragm, a piston disposed within said pressure receiving chamber below said diaphragm for vertical movement subjected to pressure transmitted from said chamber through said diaphragm, a holder disposed within said lower casing portion normally resiliently engaging said piston and a spring surrounding said holder to normally bias



the holder upwardly so as to cause the holder to engage the piston, characterized by a pair of stationary terminals having the lower ends projecting downwardly beyond the lower end of said lower casing portion, a resilient disc disposed within said upper casing portion below said diaphragm, a rod disposed within said piston below said disc and leaf springs positioned to receive resilient force from the disc through said rod as said resilient disc resiliently warps, said stationary terminals, resilient disc, rod and leaf springs forming an electrical switching section.

4,593,167

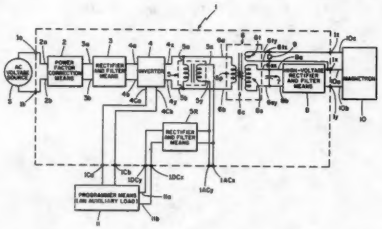
ELECTRONIC MICROWAVE OVEN POWER SUPPLY

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Filed Aug. 2, 1982, Ser. No. 404,301

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 B **38 Claims**



1. In combination with a magnetron, an operating system comprising:

a source means operative to provide an output of relatively low-magnitude unidirectional voltage,

an inverter means operative to receive said output of relatively low-magnitude unidirectional voltage and to provide an output of relatively low-magnitude high-frequency AC voltage,

a first transformer means operative to receive said output of relatively low-magnitude high-frequency AC voltage and to provide an output of relatively high-magnitude high-frequency AC voltage,

a high-frequency rectifying means operative to receive said output of relatively high-magnitude high-frequency AC voltage and to provide an output of relatively high-magnitude unidirectional voltage of substantially constant magnitude, and

means connecting said output of relatively high-magnitude

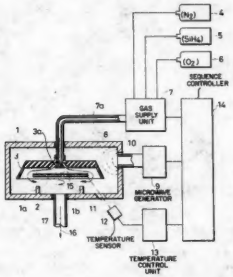
unidirectional voltage to the magnetron for energization thereof.

4,593,168

METHOD AND APPARATUS FOR THE HEAT-TREATMENT OF A PLATE-LIKE MEMBER

Haruo Amada, Kamisato, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,268
Claims priority, application Japan, Feb. 21, 1983, 58-26178
Int. Cl.[4] H05B *6/78*
U.S. Cl. 219—10.55 M **2 Claims**



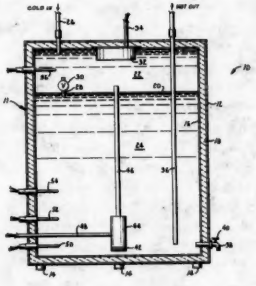
1. A heat-treating method which comprises passing streams of inert gas over surface portions of a plate-like member within a chamber to cause the member to float while being moved vertically and being rotated in the gas; irradiating the floating member with microwaves to inductively heat the member to a constant temperature; admixing reaction gases with said inert gas and forming a film of a reaction product of the reaction gases on said surface portions of said plate-like member; said chamber including a member floating jig, a stream of said inert gas being passed into said jig to cause the member to float; said jig being made of a material which is transparent to the microwaves and which transmits the microwaves whereby the jig is not inductively heated to said constant temperature; the microwaves being projected through said jig onto said member; and the reaction product being selectively formed on said member without being formed on said member-floating jig.

4,593,169

WATER HEATER

Perry W. Thomas, 12708 12th St., Grandview, Mo. 64030

Filed Mar. 5, 1984, Ser. No. 586,003
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 R **17 Claims**



1. A water heater comprising:

a first tank for holding water;

an inlet to said first tank for supplying incoming cold water thereto;

means for applying microwave energy to the water in said first tank to thereby heat the water therein when the temperature of the water in said first tank is below a preselected temperature level;

a second tank adjacent said first tank for holding water;

an outlet for said second tank for discharging heater water therefrom;

conduit means providing communication between said first and second tanks, thereby accommodating flow of hot water from said first tank to said second tank when heated water is discharged from the second tank and incoming cold water enters the first tank through said inlet; and

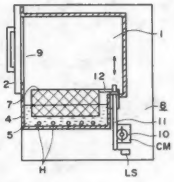
pump means for pumping water from said second tank to said first tank when the temperature of the water in said second tank is below a predetermined temperature level, said preselected level being greater than said predetermined level to maintain the first tank at a higher temperature than the second tank.

4,593,170

FOOD FRYING APPARATUS

Masahiko Maeda; Masaharu Takashima, and Masahira Takeuchi, all of Shiga, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Feb. 3, 1983, Ser. No. 463,511
Claims priority, application Japan, Feb. 9, 1982, 57-20556
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 E **9 Claims**



1. A frying apparatus for frying food, comprising:

a heating chamber for housing food, said heating chamber being substantially leakproof to microwave energy, said heating chamber having a lower portion for containing cooking oil;

heater means provided in said lower portion for heating cooking oil;

microwave supplying means coupled to said heating chamber for supplying microwave energy to said heating chamber;

food table disposed within said heating chamber for holding food therein, said food table being moveable to be lowered to a first position at which said food is dipped into said oil, and raised to a second position at which said food is raised out of said oil;

lifting means coupled to said table for lowering said table to said first position and raising it to said second position;

initiating means for initiating frying operations of said food;

position detecting means for detecting that said food table is in said first position and for providing a detection output indicative thereof;

frying operation period restricting means for restricting a frying operation period when said food is dipped into said oil and fried in said first position; and

controlling means coupled to said heater means, said microwave supplying means, and said lifting means comprising enabling means for controlling supply of electric power to said heater means and to said microwave supplying means for disabling said microwave supplying means when said

food table means is not in said first position and means for providing automatic control of said lifting means such that said food table is lowered to said first position in response to said initiating means so that said position detecting means provides said detection output, and thereafter, said food table is held in said first position until said frying operation period restricting means determines termination of said frying operation period and then said food table is raised to said second position when said determination is made by said frying operation period restricting means.

4,593,171

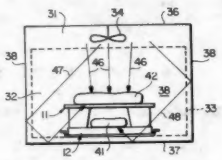
MICROWAVE OVEN TURNTABLE SHELF STRUCTURE AND METHOD

Albert E. Colato, Woodbury, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Jun. 11, 1979, Ser. No. 47,016

Int. Cl.[4] H05B *6/78*

U.S. Cl. 219—10.55 M **4 Claims**



1. In a method for heating first and second food products at different rates in a microwave oven, the steps of: supporting the food products at different heights in a single oven cavity, rotating each of the food products within the cavity, and introducing microwave energy into the cavity in such a manner that the energy in the cavity is present in a greater concentration where the first food product is supported than where the second food product is supported.

4,593,172

METHOD FOR BONDING ELECTRICALLY CONDUCTIVE WIRES

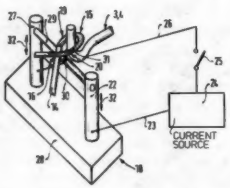
Heinz Gneiss, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,658

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300512

Int. Cl.[4] B23K *1/00*

U.S. Cl. 219—85 M **2 Claims**



1. A method for bonding electrically conductive wires, for forming a loop of intersecting first and second wire segments of a hot wire fastened on a carrier body via holder wires connected with the carrier body, by heating of a solder material, which comprises applying a layer of solder material on said second wire segment so that said solder material layer is disposed on said wire segment only at specified intervals, guiding the wire to be bonded around a wire holder thereby forming a loop including said first and second wire segments, positioning said second wire segment of said loop with said layer of solder material thereon above and in contact with said first wire segment in a vicinity of an intersection point of said first and second wire segments thereby forming said loop, positioning an electrode of a soldering tool located between poles of an electrical current circuit into contact with said first wire segment at the intersection point of said first and second wire segments with said first wire segment between said electrode and said layer of solder material on said second wire segment, applying an electrical current to said electrode of said soldering tool for the purpose of resistance heating of the electrode, until a melting temperature of the solder material on said second wire segment is attained and a secure soldered connection of the intersecting first and second wire segments at the intersection point is assured.

4,593,173

ELECTRONIC APPARATUS FOR AUTOMATIC CONTROL OF THE PLACING OF MATERIAL AT A JUNCTION BETWEEN SURFACES

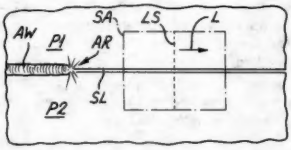
Jonathan S. E. Bromley, Oxford; William F. Clocksin, Cambridge; Peter G. Davey; Colin G. Morgan, both of Oxford, and Albert R. Vidler, Oxon, all of England, assignors to National Research Development Corp., London, England

Filed Nov. 1, 1983, Ser. No. 547,599

Claims priority, application United Kingdom, Nov. 8, 1982, 8231772

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—124.34 **4 Claims**



1. Apparatus to control the automatic placing of material along a junction between surfaces with reference to the form and position of the junction comprising:

means to deposit material controllably movable progressively along the junction in response to a control signal,

means to illuminate said junction in light of a specific wavelength,

means for producing an image of the surfaces where material is next to be placed,

said image producing means including information collection means linked to the means to deposit material to move with said means to deposit material to collect information to produce said image during controlled material placing movement along the junction,

said image producing means further including means for removing from the collected image information interfering information resulting from illumination other than by said light source of specific wavelength, said removing means comprising a spatial frequency filter means including a tapped delay line to provide a specific impulse response to respond to information in the image from said light source representing the junction position together with means to extract from the response of the spatial frequency filter that portion of the image unambiguously defining the junction form and position, and

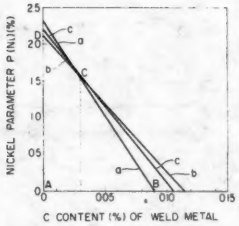
means responsive to said image portion to derive said control signal during progressive material placing movement free of the need to handle said interfering information.

4,593,174

METHOD FOR WELDING VERY LOW CARBON STEEL

Shoji Saito; Nobutaka Yurioka, and Shigeru Oshita, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,239
Claims priority, application Japan, Apr. 23, 1982, 57-67100; Apr. 23, 1982, 57-67101; Apr. 23, 1982, 57-67102
Int. Cl.[4] B23K 9/23
U.S. Cl. 219—137 WM 16 Claims



1. A method for arc welding carbon steel containing from 0.005 to 0.06% carbon, which comprises subjecting said steel to a plurality of welding passes at a welding speed of at least 30 cm/min, at least the first pass being made by nickel-bearing welding materials having a nickel content such that Q_1 in the following formula is at least 0.09% and the carbon content of the weld metal is at least 0.03%:

$$Q_1 = C_{(R)} + P_{(Ni)}/25, \text{ where}$$
$$P_{(Ni)} = 0.32Ni_{(w)} + 0.14N_{(f)}$$

in which

$C_{(R)}$: carbon content (%) of weld metal,

$P_{(Ni)}$: nickel parameter relating to nickel content, wherein $P_{(Ni)}$ is a positive value,

$Ni_{(w)}$: nickel content (%) of a member selected from the group consisting of GMAW solid wire and core wire of SMAW electrode,

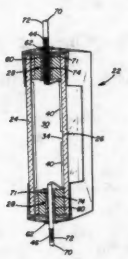
$Ni_{(f)}$: nickel content (%) of coating flux of SMAW electrode.

4,593,175

ELECTRICAL CONDUIT WITH INTEGRAL MOISTURE-VAPOR BARRIER

George H. Bowser, New Kensington; Stanley J. Pysewski, Cheswick, and Renato Chiesuzzi, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 13, 1985, Ser. No. 701,325
Int. Cl.[4] B60L 1/02
U.S. Cl. 219—203 8 Claims



1. In a heatable multiple-glazed window comprised of two or more panes held in spaced apart relation by a spacer/sealant assembly defining a sealed insulating air space between the panes, and an electroconductive heater means applied to the air space facing surface of a one of the panes, a conduit for conducting electrical current from an electric power source to the electroconductive heater means, the electric power source being disposed exteriorly of the insulating air space, the conduit comprising:

a plurality of electrical wires braided together;

a first moisture-vapor substantially impervious material at least substantially filling spaces occurring between said wires; and

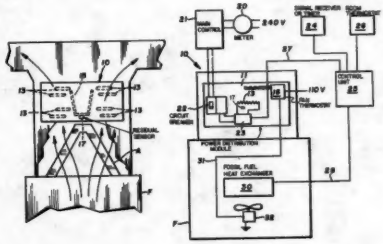
an electrically insulating sheath sealingly enclosing said braided together wires.

4,593,176

UNIT FOR CONVERTING A FOSSIL FUEL BURNING FURNACE INTO AN ELECTRICAL FURNACE

William J. Seefeldt, 400 S. Pine St., Monticello, Minn. 55362

Continuation-in-part of Ser. No. 216,160, Dec. 15, 1980, abandoned. This application Jul. 14, 1983, Ser. No. 513,603
Int. Cl.[4] H05B 1/02; F24H 3/04; F24D 5/00
U.S. Cl. 219—279 4 Claims



1. In a fossil fuel burning, forced air heating system, such system including a fossil fuel burner associated with a heat exchanger supplying heated air to an air plenum and duct system for distribution, a fan for circulating air through the system over the heat exchanger and through the air plenum and duct system and a control system for controlling operation of the fan and burner to maintain a desired temperature in a space being heated by the system, the improvement comprising an electrical heating unit inserted into the plenum and duct system downstream of the heat exchanger and fan for use when the burner is inoperative, said heating unit comprising:

a. an electrical power distribution means;

b. a first and a second source of electrical power, said distribution means arranged to deliver power from said second source at selected intervals;

c. a plurality of heating elements being positioned in the plenum system and extending substantially across the plenum;

d. said heating elements being arranged in vertical, staggered relation to one another whereby a tortuous air flow path thereover is established;

e. an air deflector member arranged generally centrally of the unit and positionally extensible to permit said air deflector member to extend substantially across the plenum in parallel relation to said heating elements and sets of said heating elements being arranged respectively along the sides of said deflector;

f. first switch means actuated by said distribution means for delivery of electrical power to said heating elements from said second power source;

g. control means responsive to delivery of a signal thereto indicative of the availability of power from said second source to selectively ready either said distribution means for transmission of power to said heating elements from said second power source when the signal is indicative of

power availability therefrom or energization of said fossil fuel burner for heat generation when the signal is indicative of power unavailability from said second source;

h. signal transmission means including signal generating means communicating with and deliverying said signal to said control means for selectively readying either said distribution means to energize said heating elements or said burner in response to the availability of power from said second source of power; and,

i. thermostatic switch means associated with the space to be heated and arranged in circuit with said control means and said distribution means for controlling actuation of said first switch means in response to the temperature level within the space to be heated.

4,593,177

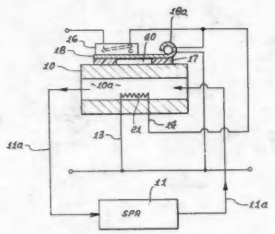
REDUCED DIFFERENTIAL, HIGH LIMIT THERMOSTAT SYSTEM

Richard M. Trostler, Claremont, Calif., assignor to Purex Pool Products, Inc., Lakewood, Calif.

Filed May 18, 1984, Ser. No. 612,059

Int. Cl.[4] F24H *1/00*; H05B *1/00, 3/02, 1/02*

U.S. Cl. 219—328 **12 Claims**



1. In combination with heat source means including a main heat generator and a mounting body,

(a) a main high limit thermostat mounted in such relation to said body as to receive heat therefrom,

(b) a thermal isolator plate operatively sandwiched between said body and said thermostat, and

(c) a heat conduction plate operatively sandwiched between said isolator plate and said thermostat, there being an auxiliary heat source located to separately heat said heat conduction plate to cause heat flow to said thermostat, said isolator plate, heat conduction plate and thermostat being mounted in closely stacked together sequence and in heat transfer relation on said body, the auxiliary heat source carried by said heat conduction plate.

4,593,178

REMOVABLE ELECTRIC HEATING ASSEMBLY FOR FLUID HEATERS AND BOILERS

Ira C. Banta, and Wayne H. Caro, both of Louisville, Ky., assignors to Cepeda Associates, Inc., Louisville, Ky.

Filed May 30, 1984, Ser. No. 615,269

Int. Cl.[4] H05B *3/82*; F24H *1/20*; F22B *1/28*

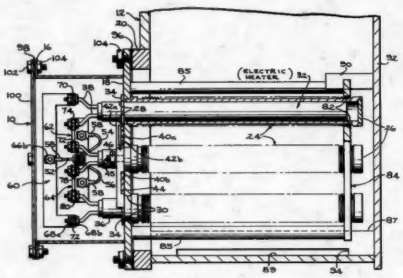
U.S. Cl. 219—315 **9 Claims**

1. A heating element assembly for use with a fluid heater comprising

a housing being open on a rear end thereof and having a flat cover plate connected to and covering a forward end thereof;

a plurality of spaced, elongated, hollow tubes, each of said tubes being open on a rear end thereof and closed on a forward end thereof and being connected on a rear end portion thereof to said cover plate so as to project forwardly of said housing, said cover plate defining a like plurality of spaced openings therethrough which register with the open end of said tubes;

a plurality of elongated electrical heater elements removably inserted in said tubes, each of said elements containing a pair of electrical terminals on a rear end thereof and having a collar fixedly attached to a rear end portion thereof which is adapted to lie flush against said plate when said element is fully inserted in one of said tubes such that an end portion of said element and said pair of terminals project rearwardly into the hollow interior of said housing;



retainer means disposed in the hollow interior of said housing and removably connected to said cover plate for securing said collars against said cover plate; and

electrical bus bar means disposed in said housing and removably connected to each of said pairs of terminals for providing electrical power to said elements, said bus bar means being electrically accessible to a remote source of electric power through a surface of said housing, said tubes and heating elements being arranged in at least two rows, said retainer means comprising at least one elongated, flat bar of width sufficient to overlie portions of the collars of said elements contained in adjacent rows located on opposite sides of said bar.

4,593,179

MULTI FUNCTION AIR HEATER

Georg Schulz, and George Spector, both c/o George Spector 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 28, 1983, Ser. No. 479,823

Int. Cl.[4] F24H *3/04*

U.S. Cl. 219—370 **1 Claim**

1. A multi function air heater and compressor which comprises:

(a) a cylindrical housing having a closed bottom and an open top;

(b) an electric fan affixed vertically in the bottom of the housing;

(c) first screen affixed around circumference of the housing to provide an air inlet for the fan;

(d) means for heating the air within the housing above the fan;

(e) a second screen affixed near the open top of the housing to provide a large air outlet; and

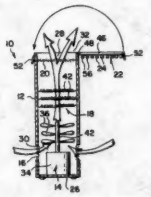
(f) means for directing the air into a plurality of small outlets, the means for directing the air can be placed in position over the open top of the housing wherein the electric fan comprises:

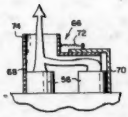
(a) an electric motor having a shaft;

(b) a plurality of fan blades affixed to the shaft to pump in fresh air from the air inlet;

(c) a switch electrically connected to the electric motor to turn the electric motor on and off, the switch placed on the housing; and

(d) a flow control electrically connected to the electric motor to determine the speed of the motor to increase and decrease the force of air, the flow control placed on the housing wherein the means for heating air comprises:
(a) a plurality of filaments, each filament placed transversely with the housing; and
(b) a switch electrically connected to the filaments to turn the filaments on and off, the switch placed on the housing wherein the means for directing the air into a plurality of small outlets comprises:
(a) a plate having a plurality of small apertures;
(b) a hinge affixed to edge of the plate and the open top of the housing so that the plate can be turned to a position over the open top of the housing;
(c) a handle affixed to top of the plate, the handle permitting easy lifting of the plate;
(d) a bracket affixed to opposite edge of the plate and the open top of the housing so that the plate can be locked and unlocked in position over the open top of the housing; and





(e) a plurality of tracks, each track positioned over a small aperture in the plate;
(f) a plurality of small pipes, each pipe having a bottom flange, the flange placed within a track so that the pipe aligns with the aperture in the plate whereby closing off the air flow of each pipe is accomplished by pushing against the pipe with a finger causing a sliding movement of the flange within the track until the pipe is aligned with the aperture of the plate; and
(g) a plurality of flexible tubes, each tube plugged into a small pipe whereby each of the tubes is used to perform a different function of the multi-functional air heater and compressor further comprising a telescoping cover, the cover being in two sections is spring loaded so it snugly fits over two outlets on the plate whereby one of the flexible tubes is plugged into the cover combining the two air flows from the two outlets into one stronger air flow into the flexible tube.

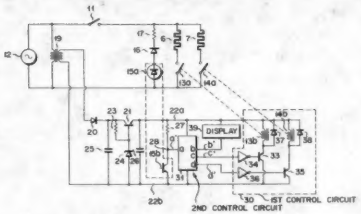
4,593,180

ELECTRIC CONTROL APPARATUS WITH UNDERVOLTAGE PROTECTION

Ryuho Narita, Nagoya, and Terutaka Aoshima, Toyohashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1983, Ser. No. 513,288
Claims priority, application Japan, Jul. 16, 1982, 57-124793
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—492 **7 Claims**

1. An electric apparatus having a heater control circuit to provide undervoltage protection, comprising:
an A.C. source adapted to receive A.C. power;
a heater switch;
at least one heater which is connected across said A.C. source through said heater switch;
a pair of control lines coupled to said A.C. source through a rectifying element;
at least one capacitor connected between said control lines;
first control means, connected between said control lines, for controlling said heater switch; and
second control means, connected between said control lines, for supplying at least one first control signal to said first control means, said second control means comprising:
an oscillator for issuing clock pulses having a prescribed frequency,
a reset pulse generator for emitting reset pulses synchronized with the frequency of said A.C. source,
a counter which counts said clock pulses and produces a count value therefrom, and is reset by said reset pulses,



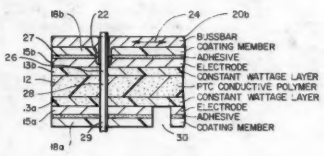
first control signal means for producing said first control signal,
second control signal means for producing a second control signal when said count value produced by said counter reaches a predetermined level due to a momentary failure of said A.C. power, and
gating means, responsive to said second control signal, for preventing said first control signal from being supplied to said first control means by said second control means, thereby causing said first control means to control said heater switch so as to interrupt power to said heater, power from said at least one capacitor being applied only to said second control means during said momentary power failure.

4,593,181

HEATING ELEMENT HAVING DEFORMED BUSS BARS

Michael L. Jensen, Mountain View, and Carney P. Claunch, II, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1984, Ser. No. 577,107
Int. Cl.[4] H05B *3/36*
U.S. Cl. 219—541 **9 Claims**



1. A heating element comprising:
a laminar member composed of a material which comprises an organic polymer and electrically conductive particles dispersed in the polymer in an amount sufficient to render the member electrically conductive;
a pair of laminar electrodes which are (a) connected to opposite faces of said laminar member, (b) substantially parallel to said laminar member; and (c) adapted to be

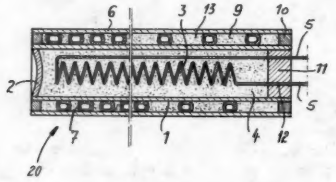
connected to an external source of power to cause current to pass through said laminar member;
an insulating coating layer secured to exposed surfaces of said electrodes; and
means for electrically interconnecting at least one electrode to said external source of power, said electrical interconnection means comprising at least one buss bar disposed adjacent said coating layer and means for deforming parts of said buss bar so that portions of said buss bar in a vicinity of said parts extend through said coating layer adjacent thereto into said at least one of said electrodes.

4,593,182

ELECTRIC CARTRIDGE HEATER

Eugen Schwarzkopf, Lüdenscheid, Fed. Rep. of Germany, assignor to Hotset Heizpatronen und Zubehor GmbH, Ludenscheid, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,586
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 3343824
Int. Cl.[4] H05B *3/44*
U.S. Cl. 219—544 **13 Claims**



1. An electric cartridge heater comprising:
an inner casing of heat conductive material having a longitudinal axis;
an elastic heating coil within said inner casing extending along said axis;
a compacted body of granular heat conductive but electrically insulating material surrounding said coil and filling said inner casing;
an outer casing of heat conductive material surrounding said inner casing and defining an annular space therewith;
a cooling-tube coil in said space surrounding said inner casing for carrying away excess heat and in contact with at least one of said casings and in thermally conductive relationship with both casings; and
a compacted mass of thermally conductive granules filling said space between the turns of said cooling-tube coil.

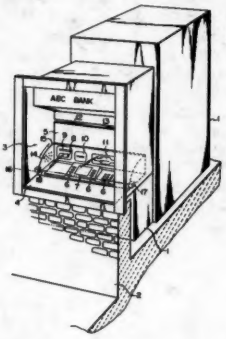
4,593,183

AUTOMATIC TRANSACTION MACHINE

Kunio Fukatsu, Ebina, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 4, 1983, Ser. No. 491,646
Claims priority, application Japan, May 6, 1982, 57-75843; May 6, 1982, 57-75848
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **11 Claims**

1. An automatic transaction machine, comprising:
a card reader for reading card information from a card;
a display for displaying operation instructions to a customer;
a voice output unit for producing a voice output which provides an operation guide for a customer;
a keyboard for entering information in accordance with the operation instructions;
a bill dispensing mechanism for dispensing a bank not corresponding to a specified amount;
a receipt issuing unit for printing a transaction content and for issuing a receipt on which the transaction content is printed;
controlling means connected to said card reader, said display, said keyboard, said bill dispensing unit, and said receipt issuing unit, said controlling means being adapted to control said voice output unit to receive the card information from said card reader, to be capable of producing



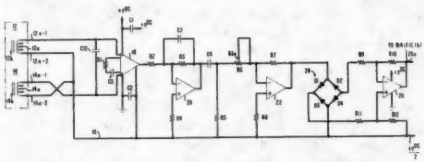
the operation instructions to the customer in at least two languages, and to produce a voice output which provides an operation guide in a selected one of said at least two languages which is selected according to specified information, wherein said specified information are achieved from any one of said keyboard and said card reader; and
prohibiting means for prohibiting the operation guide produced by said voice output unit.

4,593,184

COUNTERFEIT DETECTION CIRCUIT

David Bryce, Morrisville, Pa., and William Sherman, III, Medford, N.J., assignors to Brandt, Incorporated, Bensalem, Pa.

Filed Aug. 19, 1983, Ser. No. 524,856
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—449 **15 Claims**



1. Apparatus for detecting the presence of a genuine bill comprising:
magnetic sensor means including coil means positioned adjacent to the path of movement of a bill for generating a signal in the presence of a changing magnetic field created by the moving bill;
capacitance means forming a turned circuit with said coil means for passing signals within a predetermined band pass range in accordance with the impedance value of said coil and said capacitor;
means for amplifying the detected signal;
means for converting the detected signal to a DC level;
comparator means for comparing the converted signal against a predetermined threshold;
first storage means for storing the result of the comparison operation by said comparator means;
second storage means;
bill sensing means having a first output state as the bill is

passing said magnetic sensing means and having a second output state when said bill has passed said magnetic sensor means;

said second storage means being responsive to the change of said bill sensing means to said second state for transferring the contents of said first storage means to said second storage means;

delay means responsive to the change of said bill sensing means from said first state to said second state for resetting said first bistable means a predetermined time interval after the contents of said first bistable means has been transferred to said second bistable means.

4,593,185

SAFETY LOCK

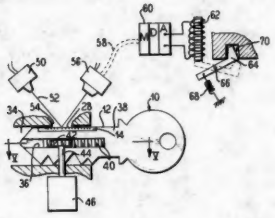
Ingeborg Patzelt, and Werner Horn, both of Berlin, Fed. Rep. of Germany, assignors to Zeiss Ikon AG, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,747

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305614

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—382 **3 Claims**



1. A lock and key combination particularly characterized by:

a key having an elongated spine on which is formed a coding surface,

said coding surface being formed with a thin laser beam generated plethora of burned coating pits having depth modulation formed as a function of selectively varied laser beam energy, and

having spacing variations formed as a function of selected relative movement between the coating surface and the laser beam during burning, thereby to provide a maximum plurality of code tracks in a minimum of space and capable of modulating a signal laser beam projected thereon to reflect both depth and spacing variables, and

a lock for receiving said key comprising

housing means including a

sensing channel for receiving said key in inserted relation therein,

said housing having window means in register with that portion of said sensing channel in alignment with said coding surface on said key, and

sensing means in alignment with said window means including a laser signal beam generator for directing a laser signal beam at said coding surface for reflection of modulated signal beam therefrom, and

a receiver unit for receiving the reflected laser signal beam after it has been modulated by the code tracks to generate a digital signal,

said sensing means comprising means for effecting relative uniform movement between said key and said laser signal beam generator,

whereby the modulated signal beam will generate a digital signal which is responsive to variations in both the depth modulations and the spacing alignment of the coding tracks, and

memory and discriminator actuating means for receiving and comparing the digital signal to determine authenticity of the key and for thereafter actuating a lock release in response to an authentic key.

4,593,186

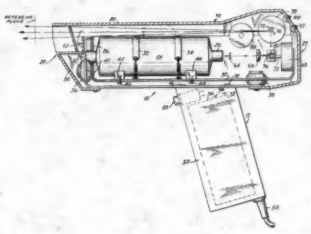
PORTABLE LASER SCANNING SYSTEM AND SCANNING METHODS

Jerome Swartz, Stonybrook; Edward Barkan, South Setauket, and Shelley Harrison, Dix Hills, all of N.Y., assignors to Symbol Technologies, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 378,919, May 17, 1982, abandoned, which is a division of Ser. No. 125,768, Feb. 29, 1980, Pat. No. 4,387,297. This application Oct. 20, 1983, Ser. No. 543,878

Int. Cl.[4] G06K *9/24, 7/10*

U.S. Cl. 235—472 **16 Claims**



1. A laser scanning system for reading bar code symbols, each in its respective turn, comprising:

(a) a light-weight, hand-held head normally supportable by a user in a normally non-contacting relationship with the symbols during reading thereof, said head including therein

(i) means for generating a laser beam, and for directing the same along a light path through an outlet port of the head to each symbol,

(ii) scanning means for repetitively scanning the directed laser beam across each symbol for reflection therefrom,

(iii) sensor means for detecting the variable intensity of each scanned laser beam reflected from each symbol, and for generating an electrical signal indicative of the detected intensity for each symbol, and

(iv) signal processing means for processing each electrical signal, and for generating a processed electrical signal for each symbol;

(b) decoding means operatively associated with the signal processing means, for decoding the processed signal for each symbol to be read;

(c) manually actuatable trigger means on the head and operatively associated with the decoding means, for initiating reading of each symbol upon each manual actuation of the trigger means from one state to another state by the user; and

(d) means operatively associated with the decoding means, for determining a successful decoding of each symbol, and for non-manually terminating the reading of each symbol upon the determination of the successful decoding thereof.

4,593,187

NON-IMAGING ILLUMINATION INCIDENCE ANGLE DETECTION SYSTEM

Jeffrey W. Grotts, Bethel, and Rene Abreu, New Fairfield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 29, 1982, Ser. No. 437,721

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R **7 Claims**

1. A detector for determining the angle of incidence of an

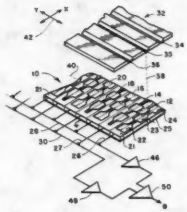
illuminating source in a plane normal to said detector, said detector including:

an opaque planar slit mask having at least one narrow transparent straight slit in the opaque plane of said mask;

a detector array in a plane parallel with and spaced from said planar slit mask, said detector array including:

a plurality of adjacent identical detector elements, the longitudinal axis of each of said plurality of elements being parallel with each other and perpendicular to said transparent slit;

the surface of each of said plurality of elements adjacent said slit mask being configured to produce a maximum detector photocurrent from irradiation through said slit falling across the first end of said element surface and a minimum detector photocurrent from irradiation



through said slit falling across the second end of said element surface;

the pattern configuration on the surface of each of said plurality of detector elements being reversed from that on the surface of adjacent elements whereby said first end of one of said elements lies adjacent the second end of an adjacent one of said elements;

first conductive means coupled to the first surface of said plurality of detector elements in said array;

second conductive means coupled to the second surface of alternate ones of said plurality of adjacent detector elements; and

log means associated with said detector elements for generating first and second log signals corresponding to photocurrents generated by said adjacent elements.

4,593,188

APPARATUS AND METHOD FOR DETECTING FOCUS CONDITION OF AN IMAGING OPTICAL SYSTEM

Masatoshi Ida, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

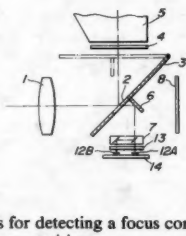
Filed Jun. 9, 1983, Ser. No. 502,546

Claims priority, application Japan, Jun. 14, 1982, 57-100759; Jul. 2, 1982, 57-114915; Jul. 20, 1982, 57-126273

The portion of the term of this patent subsequent to Aug. 8, 2002, has been disclaimed.

Int. Cl.[4] G01J *1/36*

U.S. Cl. 250—204 **13 Claims**



1. An apparatus for detecting a focus condition of an imaging optical system comprising:

means for dividing a light flux transmitted through the imaging optical system into two light fluxes;

first and second light receiving element arrays disposed in front of and at the rear of a predetermined focal plane or a plane conjugated therewith and each having a plurality of light receiving elements;

a light flux dividing optical system arranged at the light incident side of the light receiving element arrays and constructed in such a manner that images projected upon respective light receiving element arrays by respective light fluxes transmitted mainly through first and second areas of the imaging optical system which are divided by a plane including an optical axis of the imaging optical system, are shifted in the array direction in accordance with the amount of defocused condition;

means for obtaining evaluation functions F_1 and F_2 representing image sharpness and evaluation functions F_3 and F_4 representing lateral shift by processing outputs of the first and second light receiving element arrays; and

means for deciding the defocused condition and the infocused condition by arithmetically operating the evaluation functions F_1 to F_4.

4,593,189

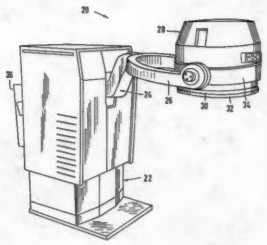
PROXIMITY DETECTOR FOR A BODY SCANNER

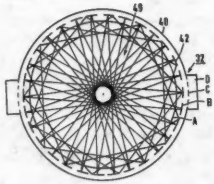
Everett W. Stoub, Villa Park, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Nov. 9, 1983, Ser. No. 549,935

Int. Cl.[4] G01T *1/20*; G01V *9/04*

U.S. Cl. 250—221 **24 Claims**





2. A proximity detector for a body scanner having a scanning surface, comprising:

(a) an energy beam emitting and receiving device in front of the scanning surface of the body scanner for a dense set of discrete energy beams projected along fixed directions in a plane parallel to the scanning surface, including

(a1) a circular reflector ring in front of the scanning surface of the body scanner;

(a2) an energy beam emitter for projecting an energy beam into the reflector ring, thereby generating said set of discrete energy beams inside the reflector ring due to a number of reflections;

(a3) an energy beam receiver for an energy beam from said set of discrete energy beams reflected out from the reflector ring; and

(b) a signal generator connected with the energy beam receiver for generating a proximity signal when at least one

energy beam from said set of discrete energy beams becomes weakened or interrupted.

4,593,190

APPARATUS FOR INSPECTING CAPSULES

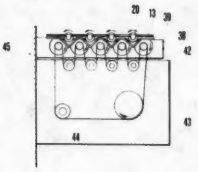
Tetsuji Kawasaki; Noriomi Miyoshi, and Yukimasa Tachibana, all of Kanagawa, Japan, assignors to Warner-Lambert K.K., Tokyo; Fuji Electric Company Ltd., Kanagawa and Fuji Elmes Co., Ltd., Tokyo, all of, Japan

Filed Jan. 11, 1984, Ser. No. 569,984

Claims priority, application Japan, Jan. 14, 1983, 58-4614; Sep. 1, 1983, 58-134448[U]

Int. Cl.⁴ G01N *9/04*

U.S. Cl. 250—223 R **14 Claims**



1. An apparatus for inspecting capsules, comprising:

and endless belt;

means for rotatingly driving said endless belt in a predetermined rotary direction corresponding to a lengthwise direction of said endless belt;

said endless belt having at least one row of throughholes provided therein along said rotary direction for receiving capsules to be inspected, with the capsules being separately received in said through-holes;

said capsules, received in said through-holes being carried by said endless belt and being moved by said rotatingly driven endless belt in a given flow direction;

a plurality of parrallelly disposed rotary rollers having rotary axes extending substantially in parallel with said flow direction of said capsules and which are arranged to contact with the capsules being carried by said endless belt in order to rotate said capsules about axes of rotation thereof; and

and optical inspecting device for optically inspecting the surface of said capsules being rotated in contact with said rotary rollers.

4,593,191

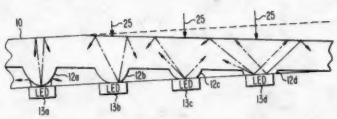
PRESSURE AND OPTICAL SENSITIVE DEVICE WITH DEFORMABLE PROTRUSIONS

Harold G. Alles, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1982, Ser. No. 454,264

Int. Cl.⁴ H01J *5/16*

U.S. Cl. 250—227 **11 Claims**



1. A touch-sensitive device adapted for use in conjunction with a source of signals, comprising

an overlay having at least one protrusion, said at least one protrusion being so disposed with respect to said source of signals and so adapted that contact between said at least one protrusion and said source of signals is increased when pressure is applied to said overlay and that signals from said source of signals that become trapped in said overlay by total internal reflection increase as a result of said increased contact, and

means for providing detection signals indicative of the level of said trapped signals.

4,593,192

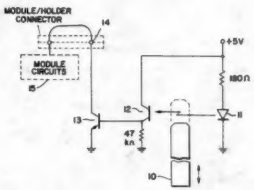
ELECTRONIC CIRCUIT MODULE AND HOLDER THEREFOR

Peter F. Slattery, Gloucester; William R. Foster; Gavin A. McLintock, both of Ottawa, and James K. Fraser, Gloucester, all of Canada, assignors to Targa Electronics Systems Inc., Ottawa, Canada

Filed Jun. 20, 1983, Ser. No. 505,738

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—229 **1 Claim**



1. A magnetic bubble memory module and a compatible module holder comprising: a locking rod for locking and unlocking the module in the module holder by inserting and withdrawing said rod, respectively; a light source and therewith aligned light sensor disposed in the module holder on opposite sides of the locking rod such that withdrawal of the locking rod is detected by activation of the light sensor by light from the light source; and signalling means for generating a signal indicating a powering down condition to a circuit in the module in response to activation of the light sensor before the magnetic bubble memory module has been removed from the module holder.

4,593,193

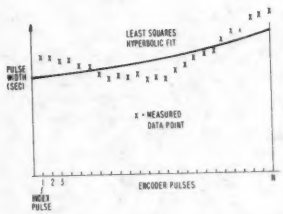
APPARATUS AND METHOD FOR GENERATING CALIBRATED OPTICAL ENCODER PULSES

Theodore D. Michaelis, Medford, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1983, Ser. No. 499,795

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—231 SE **22 Claims**



5. An apparatus responsive to the detected output signal pulses of a rotating angular optical encoder for generating a signal having uniformly-spaced pulses, which pulse spacing is the average of the time durations between successive pulses of said encoder signal, said apparatus comprising:

means for measuring the time durations between successive occurrences of said detected encoder output signal pulses;

means for determining the points of a curve based on a plot of said measured time durations correlated to said pulses and for computing individual delay times from said curve

to be applied to each of said detected encoder output signal pulses;

means for inputting signals corresponding to said individual delay times to a delay timer just prior to the occurrence of said corresponding detected encoder output signal pulse; and

means responsive to said detected encoder output signal pulses and the output signals of said delay timer for generating said signal having uniformly-spaced pulses.

4,593,194

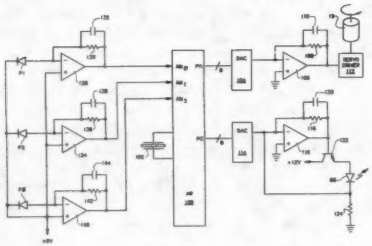
OPTICAL ENCODER WITH DIGITAL GAIN COMPENSATION CONTROLLING SOURCE INTENSITY

Randolph H. Graham, San Jose, and Joel N. Harrison, Campbell, both of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Oct. 5, 1983, Ser. No. 538,811

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **16 Claims**



1. In an optical encoder including a single light source, an array of a plurality of spaced photodetectors formed on a common substrate, a reticle disposed in fixed position relative to said photodetector array, and a scale of alternating translucent and opaque regions relatively moveable between said light source and said reticle so as to cause said array to provide a plurality of phase related analog photodetector signals whose values vary with the position of said scale, an improved digital automatic gain control system comprising:

programmed digital controller means including digital switch means for selecting among said analog signals, analog to digital converter means connected to the output of said switch means for digitizing and putting out each selected signal as a digital value, and further including processing means for reading each said digitized selected signal and for determining a known reference point, for comparing said known reference point with a nominal reference value and for computing a correction value therefrom, for storing said correction value for each selected signal and for thereafter putting out said correction value as a digital value when the corresponding analog photodetector signal is selected;

digital to analog converter means for converting each digital value put out by said controller means into an analog electrical signal; and

amplifier means connected to said digital to analog converter means and to said single light source to drive said light source in accordance with the analog drive signal corresponding to the selected analog photodetector signal.

4,593,195

METHOD AND DEVICE FOR OBTAINING INFORMATION RELATIVE TO ORGANIC MATERIALS OR MINERALS LIKELY TO BE CONTAINED IN GEOLOGICAL FORMATIONS

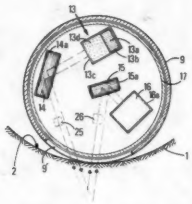
Michel Bienfait, Marseilles; Bernard Durand, Rueil Malmaison; Jean Suzanne, Marseille, and Philippe Ungerer, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Malmaison, France

Filed Apr. 4, 1984, Ser. No. 596,602

Claims priority, application France, Apr. 5, 1983, 83 05657

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—253 **29 Claims**



1. A method for obtaining information relating to at least one material contained in geological formations, wherein:

said geological formations are subjected to at least one flow of incident neutrons having a substantially well defined energy,

the incoherent inelastic diffusion spectrum of the diffused neutrons resulting from the interaction of the incident neutrons with the at least one material contained in the geological formations is established at least partially, and

from this spectrum are inferred certain of the energy amounts frequently transferred between the incident neutrons and molecules of the at least one material contained in the formations.

4,593,196

CHARGED PARTICLE ENERGY SPECTROMETER

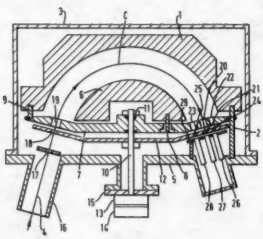
Kenneth Yates, Crawley, United Kingdom, assignor to Vg Instruments Group Limited, Crawley, United Kingdom

Filed Aug. 16, 1984, Ser. No. 641,203

Claims priority, application United Kingdom, Aug. 16, 1983, 8322017

Int. Cl.[4] H01J *40/00*

U.S. Cl. 250—305 **19 Claims**



1. A charged particle energy spectrometer comprising an electrostatic dispersive charged particle energy analyser having an exit focal plane and a dispersion axis lying in said focal plane and a multiple channel detector means comprising a plurality of charged particle detectors having their entrances disposed substantially in said focal plane and adjacent to one another along said dispersion axis, the improvement compris-

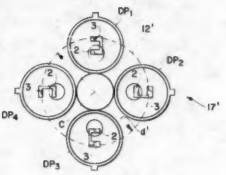
ing disposed between the exit of said analyser and said exit focal plane a fringing field corrector plate having therein a plurality of apertures each substantially aligned with a different channel of said multiple channel detector means.

4,593,197

GAS ANALYZER

Kimio Miyatake, and Junji Aoki, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 7, 1985, Ser. No. 699,394
Claims priority, application Japan, Apr. 7, 1984, 59-51621[U]
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—343 **1 Claim**



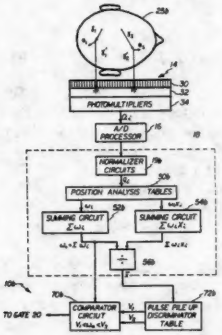
1. A gas analyzer comprising: a generally cylindrical cell having cell windows closing the opposite ends thereof and which are infrared passing material and means for passing a sample gas through said cell, a source of infrared radiation at one end of said cell, a chopper at the other end of said cell, and a sensing part at the other end of said cell on the opposite side of said chopper from said cell, and sensing part having a plurality of dual pyroelectric sensors spaced around the axis of said cell and each having a pair of elements constituted by a light receiving element for receiving infrared radiation which has passed through said cell and an auxiliary element, said pair of elements in each sensor being positioned substantially radially relative to the axis of said cell with the light receiving element radially inwardly of said auxiliary element and lying within the cross-section of the inner peripheral surface of said cylindrical cell and said auxiliary element lying outside said cross-section.

4,593,198

PULSE PILE-UP DISCRIMINATION SYSTEM

Sing C. Pang, and Sebastian Genna, both of Belmont, Mass., assignors to Digital Scintigraphics, Inc., Belmont, Mass.

Filed Nov. 18, 1982, Ser. No. 442,628
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—366 **4 Claims**



1. A pulse pile-up discrimination system for a multicell detector comprising:

means for accumulating a charge on each cell to detect its response to a radiant emission impinging on an unknown position on the detector;

means, responsive to the charge on each cell, for establishing the position of impingement of the radiant emission on the detector;

a pulse pile-up discriminator, responsive to said means for establishing the position of impingement, for providing associated with each impingement position at least lower and upper discrimination levels of a function of the distribution of charge on the cells indicative of a pulse pile-up;

means for generating a function of the distribution of charge on the cells in response to said radiant emission impinging on said unknown position of said detector; and

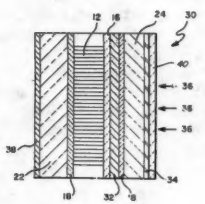
means for comparing said function of the distribution of charges on the cells in response to said radiant emission impinging on said unknown position of said detectors to said lower and upper discrimination levels of a function of the distribution of charges provided by said pulse pile-up discriminator to determine whether a pulse pile-up has occurred.

4,593,199

OPTICAL-TO-OPTICAL IMAGE TRANSDUCER CAPABLE OF ACCEPTING X-RADIATION

Zvi Yaniv, Southfield, and Robert R. Johnson, Franklin, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 22, 1985, Ser. No. 692,964
Int. Cl.[4] H05B *33/00*
U.S. Cl. 250—484.1 **9 Claims**



1. A liquid crystal light valve for accepting and transducing X-radiation, comprising:

a layer of liquid crystal for modulating readout light;

a dielectric mirror disposed on one side of said liquid crystal layer for reflecting modulated readout light;

a photosensor layer disposed adjacent said dielectric mirror and opposite said liquid crystal layer, said photosensor comprising a deposited semiconductor material, said material having a light photoconductivity substantially greater than its dark photoconductivity;

at least two transparent electrodes for receiving a bias voltage and applying it across said liquid crystal layer and said photosensor layer, one each disposed adjacent respective opposite sides of said photosensor and liquid crystal layers;

at least one transparent substrate layer, said substrate layer being disposed adjacent the transparent electrode which is on the side of said crystal layer opposite said photosensor layer; and

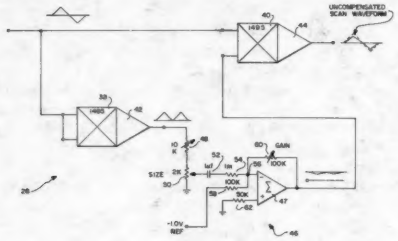
a phosphorescent layer, disposed adjacent said photosensor layer and opposite said liquid crystal layer for phosphorescing locally in a pattern corresponding to X-radiation incident thereupon, said local phosphorescence in turn stimulating a local increase in the photoconductivity of said semiconductor material, thereby resulting in local polarization of, and subsequent corresponding light emission from, said liquid crystal layer.

4,593,200

SCAN CONTROLLER FOR ION IMPLANTER DEVICE

Edward L. McGuire, III, 100 N. Winchester Blvd., Suite 260, San Jose, Calif. 95128

Filed Mar. 6, 1984, Ser. No. 586,803
Int. Cl.[4] H01J *37/256*
U.S. Cl. 250—492.2 23 Claims



19. A scan controller for directing an ion beam from an ion implanter device onto a target comprising:

means for generating a signal for guiding the ion beam; and

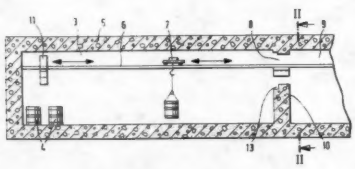
first means for continuously and quadratically compensating the signal so that the speed of the point of impact of the ion beam on the target is substantially constant to obtain a substantially even distribution of ions on the target along the path of the beam.

4,593,201

CLOSURE ARRANGEMENT FOR CLOSING A WALL OPENING IN A NUCLEAR FACILITY

Hans-Dieter Gembus, Pattensen, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,147
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238085
Int. Cl.[4] G21F *3/04*
U.S. Cl. 250—517.1 6 Claims



1. A radiation-shielding closure arrangement for closing an opening in a partition wall separating two large-area cells of a nuclear facility equipped with a bridge crane mounted on rails passing from one of said cells wherein a radiation hazard is present through said opening to the other one of the large-area cells wherein maintenance work can be conducted on the bridge crane, the arrangement comprising:

a closure body disposed in said one large-area cell and movably mounted on said rails so as to be movable from a first position in said one cell to a second position at the opening in the partition wall whereat said closure body closes the opening to radiation shield said other cell from said one cell;

said closure body having a front wall surface facing towards said other cell and said bridge crane being disposed on said rails so as to be movable thereon between said front wall surface and said other cell thereby permitting said closure body to close said opening after said bridge crane has been moved into said other cell; and,

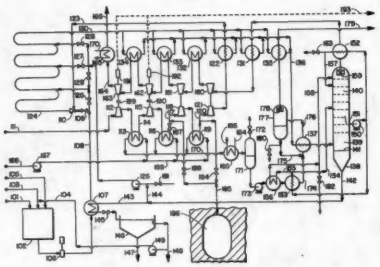
sealing means for sealing the interface between said closure body and the peripheral region of said partition wall defining said opening to completely radiation shield said other large-area cell from said one large-area cell.

4,593,202

COMBINATION OF SUPERCRITICAL WET COMBUSTION AND COMPRESSED AIR ENERGY STORAGE

Norman L. Dickinson, Monte Sereno, Calif., assignor to DIPAC Associates, Monte Sereno, Calif.

Continuation-in-part of Ser. No. 261,143, May 6, 1981, Pat. No. 4,380,960. This application Apr. 25, 1983, Ser. No. 488,198
Int. Cl.[4] F01K *27/00*
U.S. Cl. 290—54 12 Claims



1. A combination of pressurized combustion and compressed air energy storage in which air is compressed to combustion pressure by means of a compression train comprising a plurality of stages, combustion heat is transferred at combustion pressure to boiling feedwater, cooled flue gas is reheated and expanded through turbines which drive the compressor stages, the compression train having capacity in excess of that required for combustion during off-peak periods, the excess compressed air during such periods being charged to a storage cavern.

4,593,203

SEMICONDUCTOR INTEGRATED CIRCUIT WHICH ALLOWS ADJUSTMENT OF CIRCUIT CHARACTERISTICS IN ACCORDANCE WITH STORAGE DATA OF NONVOLATILE MEMORY ELEMENT

Hiroshi Iwahashi, Yokohama, and Masamichi Asano, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

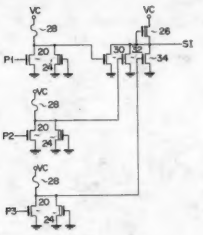
Filed Feb. 8, 1983, Ser. No. 465,034
Claims priority, application Japan, Feb. 10, 1982, 57-20101
Int. Cl.[4] H03K *19/094, 19/017, 5/12, 19/20*
U.S. Cl. 307—202.1 7 Claims

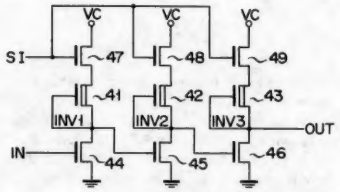
1. A semiconductor integrated circuit, comprising:

a main semiconductor circuit having a plurality of MOS transistors of a first group arranged to perform a function at an operating speed and current consumption which is responsive to an adjusting signal; and

circuit means for generating said adjusting signal to permanently set said main semiconductor circuit at a desired operating speed and current consumption, said circuit means including a plurality of MOS transistors of a second

group and a fuse coupled together to produce said adjusting signal and to permanently alter said adjusting signal





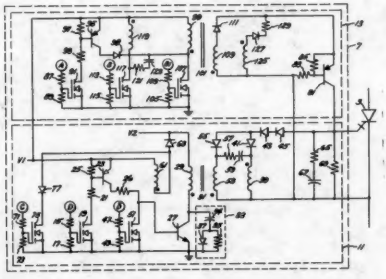
upon opening of said fuse, said circuit means further including means for selectively opening said fuse.

4,593,204

DRIVER CIRCUITS FOR GATE TURN-OFF THYRISTORS AND BIPOLAR TRANSISTORS

William McMurray, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,304
Int. Cl.[4] H03K *17/72*
U.S. Cl. 307—252 C **7 Claims**



1. A gate driver circuit for providing a turn-off pulse and a steady off-bias signal to a gate turn-off thyristor (GTO), comprising:

a first controllable switch means responsive to a first external signal for generating said turn-off pulse;

a second controllable switch means responsive to a second external signal for generating said steady off-bias signal;

first diode means;

second diode means; and

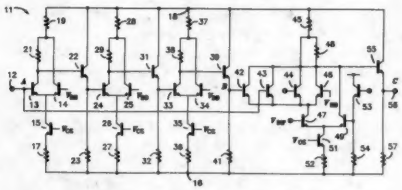
a transformer having first and second primary windings and third and fourth secondary windings, each winding magnetically coupled to each other winding, said first winding coupled in series with said first controllable switch means and adapted to be coupled to a first external power supply for supplying current to said first winding, said third winding coupled in series with said first diode means across the gate-cathode terminals of said GTO, said third winding and said first diode means poled to provide a reverse gate current turn-off pulse to the GTO when said first controllable switch means conducts, said second winding coupled in series with said second controllable switch means, and adapted to be coupled to a second external power supply for supplying current to said second winding, and said fourth winding coupled in series with said second diode means across the gate-cathode terminals of said GTO, said fourth winding and said second diode means poled to provide the off-bias signal from magnetic energy in the transformer when one of said first and second controllable switch means is biased out of conduction.

4,593,205

MACROCELL ARRAY HAVING AN ON-CHIP CLOCK GENERATOR

Alan S. Bass, and Shi-Chuan Lee, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1983, Ser. No. 510,042
Int. Cl.[4] H03K *5/135, 5/14, 19/086;* **H01L** *27/10*
U.S. Cl. 307—269 **2 Claims**



1. A macrocell array comprising:

a plurality of cells, each of said cells having a plurality of semiconductor devices, said semiconductor devices being interconnected within each cell to provide logic functions;

a plurality of input/output pads, each adapted to receive an input signal;

a plurality of horizontal routing channels within one or more metallization layers overlying said cells, said horizontal routing chennels being coupled to said plurality of semiconductor devices at selected input/output points of said logic functions;

a plurality of vertical routing channels within said one or more metallization layers overlying said cells, said vertical routing channels coupled to said horizontal routing channels and said input/output pads;

a clock generator included within one of said plurality of cells, comprising:

gate means coupled to one of said plurality of input/output pads and responsive to an input signal, and having a delayed signal as an output;

a first transistor having a base coupled to a first reference voltage;

a second transistor having a base coupled to said one of said plurality of input/output pads and differentially connected to said first transistor;

a third transistor having a base coupled to said gate means and responsive to said delayed signal, and differentially connected to said first transistor;

a fourth transistor having a base coupled to a collector of said first transistor and an emitter coupled to an output terminal for providing an output signal; and

a fifth transitor having a base adapted to receive an external override high signal and differentially connected to said first transistor for controlling said output signal regardless of said input signal; and

means coupled to said base of said fourth transistor and adapted to receive an external override low signal for controlling said output signal regardless of said input signal and said external override high signal.

4,593,206

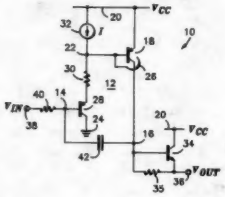
FIXED SLEW RATE BUS DRIVER CIRCUIT

Robert A. Neidorff, Chandler, and W. Eric Main, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 16, 1984, Ser. No. 571,042

Int. Cl.[4] H03K *3/26, 5/22*

U.S. Cl. 307—270 **11 Claims**



1. Monolithic driver circuit having an input for driving a load at an output thereof, comprising:

inverting amplifier means having an input and an output, said inverting amplifier means providing output signals inverted in phase with respect to input signals applied to said input;

current switch means coupled to said input of said inverting amplifier means and being adapted to receive applied logic control signals at said input of the driver circuit for sourcing or sinking currents of substantially equal magnitudes at said input of said inverting amplifier means depending on the phase of said applied logic control signals;

feedback means coupled between said output and input of said inverting amplifier means which in conjunction with said inverting amplifier means produces said output signals having controlled and substantially symmetrical slew rates associated therewith; and

buffer means coupled between said output of said inverting amplifier means and the output of the driver circuit for buffering said output of said inverting amplifier means from the load.

4,593,207

SYNCHRONIZER CIRCUIT FOR SYNCHRONIZING THE SCAN OF A DEVICE WITH AN EXTERNALLY RECEIVED TRIGGERING SIGNAL

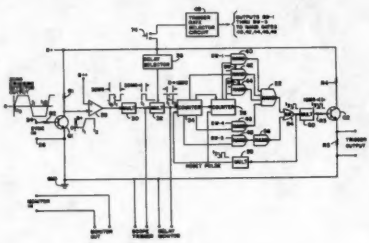
Tulon C. McRight, Jr.; William A. Friday, and Ronald W. Mitchell, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 5, 1984, Ser. No. 596,969

Int. Cl.[4] H03K *5/05, 5/156, 3/72*

U.S. Cl. 307—271 **8 Claims**

1. A synchronizer circuit for providing a precise voltage pulse output comprising: a multivibrator means, a triggering means, and a delay selector circuit; said multivibrator means being coupled to said triggering means and to said delay selector circuit; said multivibrator having an input responsive to said triggering means and then providing a pulse train having a predetermined frequency and a selectively variable duty cycle in response to said delay selector circuit coupled thereto; a pulse repetition rate control means having an input responsive to the output pulses of said multivibrator means for providing a selectable output pulse frequency less than the pulse frequency of said pulse train output of said multivibrator means; a pulse shaping and driving means responsive to the pulse repetition rate control means for providing precise reduced width output driving voltage pulses; said pulse repetition rate control means comprises counting means having an input coupled to receive said multivibrator means pulse train and having plural outputs, resistance switching means having plural outputs, and gating means coupled to receive said plural outputs of said counting means and to said plural outputs of said resistance switching means for providing said selectable



output pulse frequency from said control means at any one of five selectable frequencies less than the pulse frequency of the input pulse train; and a feedback circuit having an input coupled to receive the selectable output pulse frequency from said control means and providing a reset pulse output to said counting means, said counting means having a reset input coupled to receive said reset pulse output.

4,593,208

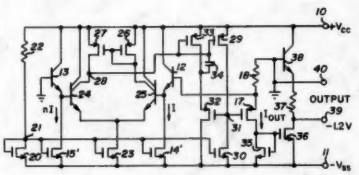
CMOS VOLTAGE AND CURRENT REFERENCE CIRCUIT

Peter S. Single, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 28, 1984, Ser. No. 594,055

Int. Cl.[4] H03L *1/02, 5/00;* **G05F** *1/58*

U.S. Cl. 307—296 R **5 Claims**



1. A CMOS current reference capable of conducting an output current having a value proportional to absolute temperature, said circuit comprising:

first and second supply terminals connectable to a source of operating power;

a first bipolar transistor having a collector connected to said first supply terminal, a base connected to a reference potential and an emitter coupled to said second supply terminal by way of a first constant current device;

a second bipolar transistor having a collector connected to said first terminal, a base coupled to said base of said first bipolar transistor through a first resistor, and an emitter coupled to said second supply terminal by way of a second constant current device;

means for ratioing the current densities in said first and second bipolar transistors so that said first bipolar transistor conducts a multiple of the current density of said second bipolar transistor;

a field effect transistor having a source coupled to said base of said second bipolar transistor, a drain coupled to conduct said output current, and a gate; and

a differential amplifier having an output coupled to said gate

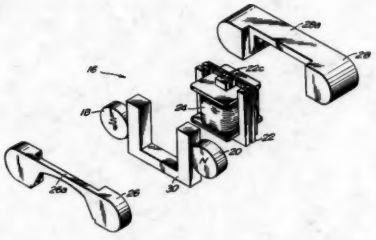
of said field effect transistor, a non-inverting input coupled to said emitter of said first bipolar transistor and an inverting input coupled to said emitter of said second bipolar transistor whereby said differential amplifier drives said base of said second bipolar transistor, by way of said field effect transistor acting as a source follower, to force said emitters of said first and second bipolar transistors to the same potential so that the differential base to emitter voltage (ΔV_{BE}) of said first and second bipolar transistors appears across said first resistor.

4,593,209

READ HEAD FOR WIEGAND WIRE

Carroll D. Sloan, Ambler, Pa., assignor to Echlin Inc., Branford, Conn.

Filed May 24, 1984, Ser. No. 613,635
Int. Cl.[4] G11C *11/04;* H03K *3/45*
U.S. Cl. 307—419 **5 Claims**



1. A read head for use with a Wiegand Wire where a pick-up coil on a core responds to the field change generated from a switch in state of the Wiegand Wire to provide an output pulse, comprising:

first and second magnets outboard of the pick-up coil and core, the magnetization of said magnets being in substantially opposite directions,

a first magnetic field shunt coupling a first face of said first magnet to a first face of said second magnet, said first faces of said first and second magnets having opposite polarities,

a second magnetic field shunt coupling a second face of said first magnet to a second face of said second magnet, said second faces of said first and second magnets having opposite polarities,

said first shunt providing substantially greater magnetic reluctance than said second shunt so that the leakage flux along the face of said read head from said first shunt is substantially greater than the leakage flux along the face of said read head from said second shunt.

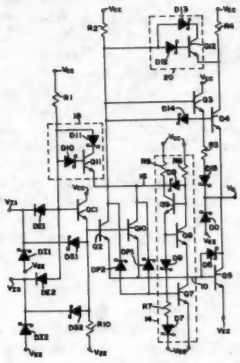
4,593,210

SWITCHING CIRCUIT WITH ACTIVE PULL-OFF

Richard M. Boyer, Orem, Utah, assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Aug. 1, 1983, Ser. No. 519,440
Int. Cl.[4] H03K *19/013*
U.S. Cl. 307—443 **7 Claims**

1. A gate in which: a bipolar drive transistor has an emitter, a base, and a collector coupled to a first voltage supply; a like-polarity bipolar output transistor which turns on in response to the drive transistor turning on and turns off in response to the drive transistor turning off has an emitter coupled to a second voltage supply, a base responsive to the voltage level at the emitter of the drive transistor, and a collector; a like-polarity bipolar pull-off transistor has an emitter coupled to the second supply, a base, and a collector coupled to the base of the output transistor; and control means turns off the pull-off transistor in response to the drive transistor turning on, turns on the pull-off transistor in response to the drive transistor turning off so as to help turn off the output transistor, and then keeps the pull-off transistor turned on in response to the voltage level at the collector of the pull-off transistor; characterized by:



a like-polarity bipolar input transistor having an emitter coupled to the base of the drive transistor, a base, and a collector coupled to the first supply; and

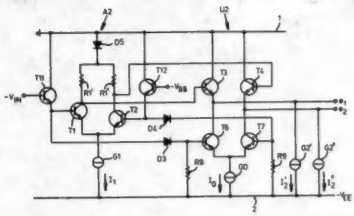
a voltage reference coupled between the collector of the drive transistor and the base of the input transistor.

4,593,211

LOW-DISSIPATION OUTPUT STAGE FOR BINARY TRANSMITTERS

Piero Belforte, Turin, Italy, assignor to Cselt - Centro Studi e Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed Nov. 17, 1983, Ser. No. 552,499
Claims priority, application Italy, Nov. 24, 1982, 68364 A/82
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—455 **1 Claim**



1. A circuit arrangement for transmitting a binary signal over a two-wire line, comprising:

a source of direct current having a first and a second terminal;

an input stage including a pair of control transistors with collectors connected via respective resistors to said first terminal, one of said control transistors having a base connected to be energized by the binary signal to be transmitted, the other of said control transistors being connected to a supply of constant reference voltage having a magnitude intermediate a low and a high level of said binary signal;

two driving transistors with collectors tied to said first terminal, with bases respectively connected to the collectors of said control transistors and with emitters respectively tied to the wires of said line;

a principal current generator connected to said second terminal;

an ancillary current generator connected to said second terminal, said control transistors having emitters connected in parallel to said ancillary current generator;

switchover means inserted between said principal current generator and the emitters of said driving transistors said switchover means being controlled by said input stage to connect said principal current generator to the emitter of whichever driving transistors is less conductive than the other with a given value of said binary signal supplied to the base of said one of said control transistors,

said switchover means comprises two switching transistors of the same conductivity type as said driving transistors with collectors respectively connected to the emitters of said driving transistors, with emitters connected in parallel to said principal current generator and with bases connected to respective biasing circuits extending between said input stage and said second terminal, and

two supplemental current generators respectively connected between said second terminal and the emitters of said driving transistors; and

wherein said ancillary current generator and said supplemental current generators are of substantially lower power than said principal current generator,

wherein said biasing circuits include the forward resistances of respective diodes inserted between said input stage and the bases of said switching transistors,

wherein said input stage further includes a pair of pilot transistors respectively inserted between said first terminal and the bases of said control transistors, said pilot transistors being respectively responsive to said binary signal and to said reference voltage, each of said diodes connected between the base of a respective control transistor and the base of the switching transistor in series with the driving transistor coupled to the respective control transistor, and

a further diode inserted with forward conductivity between said firt terminal and the resistors connected to the collectors of said control transistors.

4,593,212

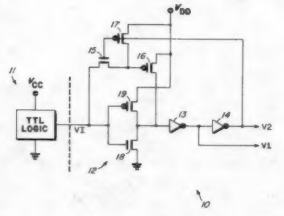
TTL TO CMOS INPUT BUFFER

Yehuda Svager, Raanana, Israel, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1984, Ser. No. 687,042

Int. Cl.[4] H03K *19/017, 3/037, 19/094, 19/003*

U.S. Cl. 307—475 **8 Claims**



1. A TTL to CMOS input buffer comprising:

a first P channel transistor having a control electrode for receiving a TTL signal, a first current electrode coupled to a first power supply terminal, and a second current electrode;

a second N channel transistor having a control electrode coupled to the control electrode of the first transistor, a first current electrode coupled to the second current electrode of the first transistor, and a second current electrode coupled to a second power supply terminal;

a third P channel transistor having a first current electrode coupled to the first power supply terminal, a second current electrode coupled to the second current electrode of the first transistor, and a control electrode; and

signal coupling means for coupling the TTL signal to the control electrode of the third transistor in response to the TTL signal switching from a logic high to a logic low.

4,593,213

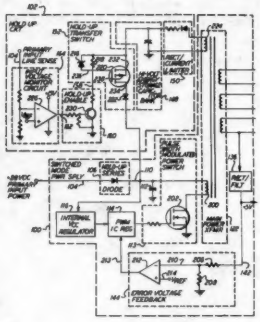
CURRENT-LIMITED MOSFET SWITCH

Richard V. Vesce, East Hampton, and John R. Torres, Somers, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1984, Ser. No. 614,172

Int. Cl.[4] H03K *17/16*

U.S. Cl. 307—564 **4 Claims**



1. A current-limited switch, comprising:

a metal-oxide-semiconductor field-effect transistor (MOSFET) having a maximum drain current rating and having its source and drain connected for conducting electrical current therebetween; and

a zener diode connected between the gate and source of the MOSFET for biasing the gate of the MOSFET at the zener diode avalanche voltage for limiting the magnitude of the flow of electrical current between the MOSFET source and drain to an absolute value less than the absolute value of said maximum drain current rating.

4,593,214

CIRCUIT FOR DISCHARGING BOOTSTRAPPED NODES IN INTEGRATED CIRCUITS WITH THE USE OF TRANSISTORS DESIGNED TO WITHSTAND ONLY THE NORMAL VOLTAGE

Robert J. Proebsting, Argyle, Tex., assignor to Thomson Components - Mostek Corporation, Carrollton, Tex.

Filed Jan. 5, 1984, Ser. No. 568,553

Int. Cl.[4] H03K *17/10*

U.S. Cl. 307—578 **4 Claims**

2. An integrated circuit having a plurality of circuit elements having electrodes and being interconnected between a power supply terminal and a ground terminal, which circuit elements have a conventional construction to withstand the application of a predetermined power supply voltage from said power supply terminal on the electrodes thereof without suffering from hot-electron effects, said integrated circuit further including a subcircuit for discharging a bootstrap voltage node having a voltage of magnitude approximately 1.5 times the magnitude of said power supply voltage to ground and comprising:

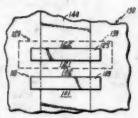
a first field-effect transistor having a first gate connected to a first gate voltage and first and second electrodes connected to said bootstrap voltage node and to an intermediate node;

a second field effect transistor having a second gate connected to a second gate voltage and first and second elec-

trodes connected to said intermediate node and ground; characterized in that:

said first and second transistors are of said conventional construction and are the only circuit elements in a discharge current path between said bootstrap voltage node and ground;

said first field effect transistor is a depletion transistor of predetermined channel type; and



said second field effect transistor is an enhancement transistor of said channel type and said second gate voltage is less than or equal to said first gate voltage and less than said power supply voltage, so that the voltage across either of said first and second transistor is less than said power supply voltage.

4,593,215

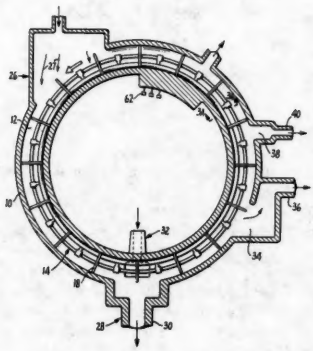
ELECTROMAGNETIC DRIVE FOR SHAFTLESS ROTARY DEVICES

Eric A. Salo, 15898 Via Pinale, San Lorenzo, Calif. 94580

Continuation of Ser. No. 921,463, Jul. 3, 1978, abandoned. This application May 23, 1980, Ser. No. 152,587

Int. Cl.[4] H02K *33/00*

U.S. Cl. 310—36 **4 Claims**



1. For a shaftless rotary device comprising a housing, a chamber therein, and a rotary element carried within said chamber for rotational movement about a central axis of said rotary element, an electromagnetic drive for said device comprising a pair of axially spaced magnetic rotor cores carried by said rotary element and extending around said rotary element, windings for said rotor cores, a pair of axially spaced magnetic stator cores carried by said housing, windings for said stator cores, said stator cores and windings being in closely adjacent relation to said rotor cores and rotor core windings and being in electromagnetic register therewith, said stator core windings comprising conductors which extend continuously in series connected relation from one stator core to the other, said conductors having a winding configuration such that at axially aligned positions the stator windings have reversed magnetic polarity, whereby conductor elements extending axially of said rotary element and carried thereby will have induced therein opposing voltages tending to produce net zero stray currents.

4,593,216

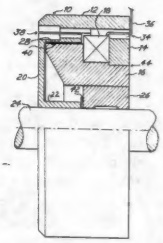
ROTARY STEPPING MOTOR HAVING IMPROVED CONSTRUCTION

Frederick P. Willcox, New Canaan, Conn., assignor to IBM Business Machines Corporation

Filed Sep. 24, 1982, Ser. No. 422,937

Int. Cl.[4] H02K *37/00*

U.S. Cl. 310—49 **28 Claims**



1. In an electromagnetic device;

a stator of magnetic material having first and second parts;

said first part comprising (a) a first cylindrical portion constituting a center pole and having an outer diameter, and (b) a second cylindrical portion of smaller outer diameter than said outer diameter of said first cylindrical portion; said first and second cylindrical portions being integral with each other;

said second part comprising a first cylindrical portion having an inner diameter substantially greater than said outer diameter of said first cylindrical portion of said first part, to form (a) an outer pole, (b) a fist annular space between said center and outer poles, and (c) a second annular space between said center pole and said outer pole;

said second annular space being defined by said second cylindrical portion of said first part and said first cylindrical portion of said second part,

a rotor of magnetic material mounted for rotation in said first annular space;

each of said rotor and said stator having complementary teeth, the rotor teeth and the stator teeth being spaced apart to form a working air gap between them, and

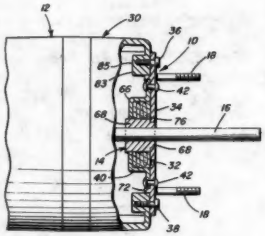
a cylindrical coil located in said second annular space and on said second cylindrical portion of said first part, said cylindrical coil having an inner diameter, said coil having two sides, the first side being the side of said coil closest to said first annular space and the second side being the other side of said coil;

said first part extending from a position contiguous with said first annular space, through said cylindrical coiland for a substantial distance beyond said second side of said coil;

said second part having a second cylindrical portion which is integral with said first cylindrical portion of said first part and which extends to and is contiguous with the portion of said first part which extends said substantial distance beyond said coil;

said second cylindrical portion of said second part having an inner diameter no greater than the inner diameter of said coil, and the portion of said first part which extends for said substantial distance having an outer diameter no greater than the inner diameter of said coil.

4,593,217
REVERSIBLE ELECTRIC MOTOR BEARING PLATE ASSEMBLY
Fred Levine, P.O. Box 380876, Miami, Fla. 33138
Filed Jun. 29, 1981, Ser. No. 278,620
Int. Cl.⁴ H02K *5/16*
U.S. Cl. 310—90 **2 Claims**



1. An electric motor bearing plate assembly designed to permit a quick and easy reversal of an electric motor rotor, said bearing plate assembly comprising:

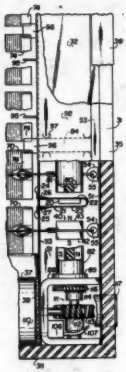
bearing plate means attachable to an end housing of an electric motor;

bearing cup means operably attachable to said bearing plate means and serving to support a bearing operably associated with the rotor shaft of an electric motor; and

hand tool operable attachment means for removable attachment of said bearing plate assembly to an electric motor, said bearing plate means including a generally flat plate, said attachment means including screw threaded means securing the plate to an end housing of the electric motor, said bearing cup means including a bearing cup, means securing the bearing cup to the interior of the bearing plate, said bearing plate and bearing cup including a centrally located aperture, a bearing mounted on and between said bearing plate and bearing cup in permanent alignment with the apertures for rotatably journaling a rotor shaft extending therethrough and a rim on the interior of the bearing plate engaging the interior periphery of a large opening in the end housing of the motor to maintain concentricity between the motor housing and stator therein and the rotor shaft and rotor thereon to maintain a proper air gap between the rotor and stator, said screw threaded means only resisting thrust along the rotational axis of the rotor shaft with the rim transferring radial load of the rotor shaft to the end housing of the motor and accurately positioning the bearing plate means with respect to the end housing when mounted thereon.

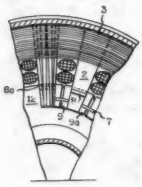
4,593,218
DIRECTIONAL CONTROL OF PERMANENT MAGNET ROTORS
Edward C. Streeter, 89 Park Place, Park Parade, Harrogate, N. Yorkshire, England
Continuation-in-part of Ser. No. 511,757, Jul. 7, 1983, abandoned. This application Jan. 31, 1985, Ser. No. 697,017
Int. Cl.⁴ H02K *49/06*
U.S. Cl. 310—103 **9 Claims**

1. Apparatus for simultaneously adjusting the rotational angles of a series of permanent magnet rotors, each having a magnetic axis substantially perpendicular to its rotor axis and, by mutual magnetic coupling, contributing to a restoring torque on an adjacent rotor, comprising a rotatable control field permanent magnet common to all of the rotors and having a magnetic axis substantially perpendicular to its axis of support and spaced from said rotors in magnetic flux linking relationship therewith, and means for adjusting the rotational angle of said control field magnet about said axis of support to



apply control torques to said rotors that balance said restoring torques at desired rotational angles of said rotors.

4,593,219
POLE SHOE RING FOR ELECTRICAL MACHINES
Karsten Laing, 632 Marsat Ct., Chula Vista, Calif. 92011
Filed Nov. 2, 1984, Ser. No. 667,696
Int. Cl.⁴ H02K *1/18*
U.S. Cl. 310—218 **1 Claim**



1. A pole shoe element for widening the teeth of electrical machines having discrete teeth, in particular of electric motors having a spherical gap for the magnetic flux, characterized in that each tooth (2) has a groove (8*a*) running in the circumferential direction and that soft iron pieces (9 and 9*a*) serving to widen one tooth (2) are connected together by a strap (8) forming with said soft iron pieces an H-shaped pole shoe element, said strap (8) adapted to fit within said groove (8*a*) in said tooth (2) and that each of a plurality of H-shaped pole shoe elements (9, 8, 9*a*) is united into a ring with adjacent H-shaped pole shoe elements connected by straps (7) of small cross section, which lie at one axial end of the ring.

4,593,220
BRUSH BEARING SUB-ASSEMBLY FOR ELECTRIC MOTOR
Walter K. Cousins, and Ralph A. Secoura, both of Raleigh, N.C., assignors to Black & Decker Inc., Newark, Del.
Filed Jul. 12, 1984, Ser. No. 630,254
Int. Cl.⁴ H02K *13/00*
U.S. Cl. 310—239 **23 Claims**

1. A sub-assembly for an electric motor having an armature assembly including a commutator and a field assembly including a field winding providing a magnetic field for said armature assembly, said sub-assembly comprising:

a plate of insulating material having a central aperture for receiving said commutator;

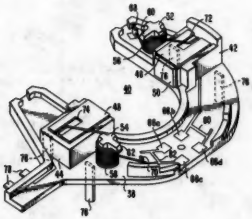
a pair of opposed frame means for supporting brushes in operative relation to said commutator, said frame means extending from one side of said plate;

a circuit pattern in said plate;

means for electrically coupling said circuit pattern to said brushes;

field winding contact means extending from said plate for electrically connecting said circuit pattern to said field winding; and

power contact means extending from said plate for electrically connecting said circuit pattern to an electrical power source,



said field winding contact means comprising a plurality of conductive fingers extending from and perpendicular to said other side of said plate, and

said electrically coupling means comprises a pair of spring post means for axially supporting a pair of electrically-conductive brush-biasing springs, said spring post means extending from said one side of said plate, each said spring post means being disposed adjacent a respective one of said frame means, and said electrically coupling means further comprises a pair of electrically-conductive spring stop means extending from said one side of said plate for securing one end of a respective one of said springs and for electrically connecting said springs to said circuit pattern, each said spring stop means being disposed adjacent a respective one of said spring post means.

4,593,221

ELECTRIC MOTOR BRUSH BOX WITH STRESSED OPPOSING WALLS

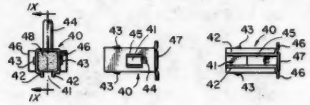
David Harris, Wolsingham, and Alan Hays, Spennymoor, both of England, assignors to Black & Decker Inc., Newark, Del.

Division of Ser. No. 456,701, Jan. 10, 1983, Pat. No. 4,498,230. This application Nov. 27, 1984, Ser. No. 675,139

Claims priority, application United Kingdom, Jan. 8, 1982, 8200514

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—242 **12 Claims**



1. An electric motor, comprising:

an armature having a commutator;

a brush resiliently urged towards said commutator;

a brush box in which said brush is located;

said brush box having two opposed walls with a slot therebetween, said two opposed walls being stressed to grip and hold against movement said brush;

a hollow brush box mounting having a wall with a rail, said rail protruding into the interior of said brush box mounting and extending parallel to said slot; and

said brush box being received within said brush box mounting with said rail forced into said slot and sufficiently separating said opposed walls to enable said brush to move in said brush box and contact said commutator.

4,593,222

ELECTRIC CONTROL MOTOR

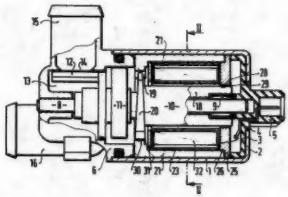
Rainer Burkel, Asperg, and Bernd Taubitz, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 660,996

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337590

Int. Cl.⁴ H02K *1/12*

U.S. Cl. 310—254 **6 Claims**



1. An electric control motor comprising a housing provided with an electromagnetic coil and an armature, said armature being rotatably mounted upon a shaft in spaced relation with said shaft, said motor being provided with magnetic poles disposed upon pole pieces provided with an arcuate cross-section, each of said pole pieces being further provided with an associated magnetic pole, said pole pieces being further provided with extremities mounted in radially spaced relation, the extremity of each of said pole pieces remote from the magnetic poles being arranged to communicate via a magnetically conductive plate and further being arranged to protrude into a complemental recess provided in said plate so as to be retained therein, and the extremity of each of said pole pieces adjacent said pole is disposed in a recess provided in a non-magnetic support disc for retention therein.

4,593,223

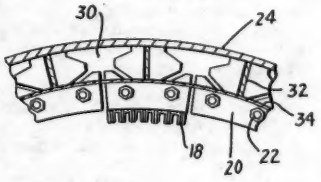
BULB GENERATOR STATOR YOKE

Kalman N. Lehoczky, New Berlin, Wis., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 27, 1984, Ser. No. 655,153

Int. Cl.⁴ H02K *1/12*

U.S. Cl. 310—258 **20 Claims**



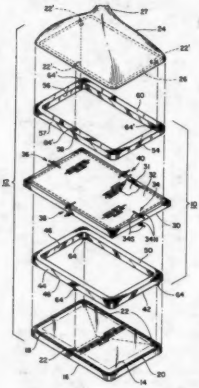
1. A stator yoke for a bulb generator having a core, comprising:

a wrapping plate having first and second opposed ends;

first and second flanges connected to the respective first and second ends of the wrapping plate;

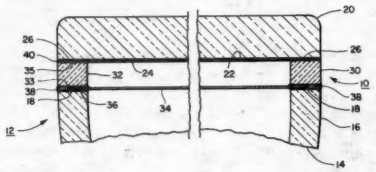
first and second yoke plates each having an opening;
means for connecting the core and yoke plates; and
an axial rib extending through the yoke plate openings and interconnecting the wrapping plate, the yoke plates and the flanges.

4,593,224
TENSION MASK CATHODE RAY TUBE
Kazimir Palac, Carpentersville, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Sep. 30, 1983, Ser. No. 538,001
Int. Cl.[4] H01J *29/06, 29/24*
U.S. Cl. 313—402 **27 Claims**



1. A tensed color selection electrode assembly utilizable for screening a pattern of luminescent primary color elemental phosphor areas upon the target surface of an envelope section of a color cathode ray tube, and which is adapted to being frit sealed between said envelope section and a funnel section of said tube to permit selective excitation of said primary color phosphor areas by a scanning electron beam, said envelope section having a sealing land and having registration affording means associated therewith and being formed of a material having a predetermined temperature coefficient of expansion, said electrode assembly comprising:
separate first frame means defining a central opening dimensioned to enclose said target surface of said envelope section;
said first frame means being formed of a material having a temperature coefficient of expansion approximating that of said envelope section and comprising a pair of substantially flat, spaced-apart surfaces constituting sealing lands;
separate second frame means defining a central opening of a span substantially conforming to that of said first frame means, formed of a material having a temperature coefficient of expansion approximating that of said envelope section and also comprising a pair of substantially flat, spaced-apart surfaces constituting sealing lands,
one of said second frame means sealing lands being disposed in a confronting relation to one of said first frame means sealing lands;
a planar tensed foil, having a predetermined pattern of apertures, presenting one side of a peripheral portion thereof to said one sealing land of said first frame means and presenting the opposite side of said peripheral portion to said one sealing land of said second frame means,
indexing means associated with the other of said first frame means sealing lands and cooperable with said envelope section registration affording means to permit precise registration between said apertured foil and said envelope section; and
cementing means disposed between said confronting sealing lands of said first and second frame means and in intimate contact with said peripheral portion of said foil presented to said confronting sealing lands, for bonding said first frame means to said second frame means for capturing said foil therebetween and for maintaining said foil in tension.

4,593,225
TENSION MASK COLAR CATHODE RAY TUBE
Leonard Dietch, Skokie, and Kazimir Palac, Carpentersville, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Aug. 31, 1984, Ser. No. 646,862
Int. Cl.[4] H01J *29/81, 29/07*
U.S. Cl. 313—407 **1 Claim**

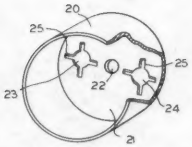


1. A tension mask color cathode ray tube comprising:
an envelope funnel having a central axis and including a bell portion, one extremity of which has a sealing land;
a flat face panel formed of a material having a predetermined temperature coefficient of expansion and comprising a target surface having a pattern of luminescent primary color elemental phosphor areas deposited thereon and a sealing land circumscribing said target surface; and
a color selection electrode structure permitting selective excitation of said phosphor areas by a scanning beam of electrons, comprising:
a planar tensed foil formed of a material having a temperature coefficient of expansion greater than that of said panel and having a predetermined pattern of apertures;
an insulating frame defining a central opening dimensioned to enclose said target surface of said face panel and formed of a material having a temperature coefficient of expansion approximating that of said face panel, the frame being substantially spatially coextensive with said sealing land on said face panel and with said funnel bell sealing land,
said frame having a radially extending support surface facing away from said target surface and fixedly receiving said foil in tension, said foil overlying a radially inward portion but not a radially outward portion of said support surface such that said foil does not extend to the outer surface of said tube, thereby providing isolation of high voltage applied to the foil,
said frame being sealed between said funnel sealing land and said panel sealing land to constitute an integral part of the tube envelope,
said frame further having an axial dimension between said foil surface and an opposed face panel sealing surface which establishes said foil at a predetermined Q distance from said target surface.

4,593,226
COLOR CATHODE RAY TUBE HAVING ELECTRON GUN WITH REDUCED EDDY CURRENT LOSS AT SHIELD CUP

Kazuaki Naiki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,673
Claims priority, application Japan, Feb. 9, 1983, 58-20111; Feb. 9, 1983, 58-20112
Int. Cl.⁴ H01J *29/51*
U.S. Cl. 313—413 **10 Claims**

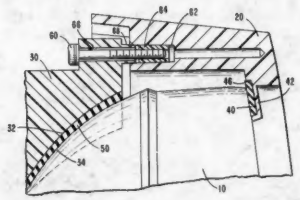


1. A color cathode ray tube comprising a glass envelope, an in-line electron gun in a neck portion of said glass envelope for radiating three electron beams, a phosphor screen formed on an end of said glass envelope, a shadow mask disposed inside said envelope and adjacent said phosphor screen, a deflection yoke for deflecting said three electron beams radiated from said in-line electron gun to form rasters on said phosphor screen, said in-line electron gun including a shield cup on the side of said deflection yoke with three apertures therein for passing said three electron beams, two of said three apertures being outside a third and centrally positioned one of said three apertures, a plurality of slender cuts being provided around both of the outside apertures to reduce eddy current loss caused by a deflection field of said deflection yoke.

4,593,227
CATHODE RAY TUBE MOUNTING MEANS

Clarence A. Bruce, St. Albans; Yoong G. Koh, Jericho; Paul Matwey, Mt. Sinai; Mitchell H. Maiman, Holbrook; Wing C. Chan, Valley Stream, and Thomas J. DeFreest, Bohemia, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 5, 1985, Ser. No. 752,289
Int. Cl.⁴ H01J *31/00*; H04N *5/645*
U.S. Cl. 313—482 **1 Claim**



1. A cathode ray tube mounting means for mounting a cathode ray tube comprising:

a bezel having an opening therethrough for viewing the face of the cathode ray tube, said opening defined by an inner projecting flange member having a recess on the back surface thereof and having a plurality of fastener and cylindrical alighnment receptacles defined in the rear portion thereof;

a resilient material attached in the recess of said inner flange member of said bezel for engagement with the face of the cathode ray tube for retaining the face of the cathode ray tube at a relatively fixed distance within the bezel;

a rear support defining an opening therethrough for receiving the rear portion of the cathode ray tube, said rear support having an inner surface conforming to the shape of the rear portion of the cathode ray tube, said rear support also having a plurality of holes around the outer periphery thereof corresponding to the plurality of fastener receptacles defined in the rear portion of said bezel and a plurality of rigid cylindrical alignment projections adapted for engagement with said cylindrical alignment receptacles;

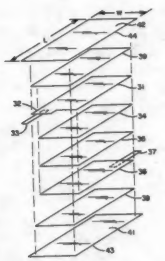
resilient material shaped to conform to the shape of the cathode ray tube and attached to said rear support for engaging the rear surface of the cathode ray tube; and

a plurality of fastener means extending through the plurality of holes in said rear support and adapted to engage the plurality of fastener receptacles in said bezel so as to cause said plurality of rigid cylindrical alignment projections to engage said cylindrical alignment receptacles so as to accurately align said bezel to said rear support and in turn to align said cathode ray tube with respect to said bezel and said rear support.

4,593,228
LAMINATED ELECTROLUMINESCENT LAMP STRUCTURE AND METHOD OF MANUFACTURING

Loren R. Albrechtson, 5216 Militia La., Columbus, Ohio 43230; Robert B. Reif, 2633 Suann Ave., Grove City, Ohio 43123, and William B. Thompson, 3737 Lindhurst Rd., Columbus, Ohio 43220

Filed May 15, 1984, Ser. No. 610,427
Int. Cl.⁴ H01J *1/62*; B05D *5/06, 5/12*
U.S. Cl. 313—509 **7 Claims**



1. In an electroluminescent device comprising operative materials including a conductive window layer with an electroluminescent material layer applied thereto, a dielectric resistant material layer applied thereto, and a conductive layer applied thereto, the improvement comprising:

a. a layer of waxy polymer laminated on each side of the operative materials of the device, and

b. a layer of hard surface moisture impervious resin material laminated and heat sealed on the outside of the polymer layers and around the outside edges of the device, to form a moisture impervious and encapsulated unified assembly substantially free of moisture.

4,593,229
SHIELD CUP TO CAGE ASSEMBLY CONNECTING TAB MEMBER FOR PHOTOMULTIPLIER TUBE

Arthur F. McDonie, and Donald B. Kaiser, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed May 18, 1984, Ser. No. 611,873
Int. Cl.⁴ H01J *40/04, 43/06*
U.S. Cl. 313—533 **6 Claims**

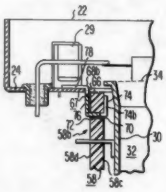
1. In a photomultiplier tube comprising an evacuated envelope having a photoemissive cathode, a shield cup spaced from said cathode and an electron multiplier cage assembly abutting said shield cup, said cage assembly including a pair of transversely spaced insulating support plates having oppositely disposed surfaces, a plurality of dynodes, and an anode dis-

posed between said support plates, the improvement comprising

a plurality of oppositely disposed locating slots formed in said shield cup,

at least one tab slot formed through the oppositely disposed surfaces of each of said support plates, and

a plurality of connecting tab members for attaching said support plates to said shield cup, each of said tab members having oppositely disposed bifurcated ends, one of said bifurcated ends including a locking portion for securely engaging one surface of said support plate, said locking portion comprising a pair of locking tabs separated by a



first notch, the other of said oppositely disposed bifurcated ends including an attachment portion for fixedly attaching said tab member to said shield cup thereby securely interconnecting said cage assembly to said shielded cup, said attachment portion comprising a pair of attachment tabs separated by a second notch, each of said tab members further including a slot engaging portion adjacent to said locking portion and disposed within said tab slot of said support plate, and a locating portion extending from the other end of said slot engaging portion along the other oppositely disposed surface of said support plate and through one of the locating slots formed in said shield cup.

4,593,230

DUAL-MODE ELECTRON GUN

Richard B. True, Sunnyvale, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 29, 1982, Ser. No. 362,790

Int. Cl.[4] H01J *29/48, 1/46, 29/46*

U.S. Cl. 315—14 **17 Claims**

1. An improved electron gun for dual-mode operation, comprising:

a cathode having a spherical surface and an annular anode;

a first, close-in control grid located adjacent to said cathode having an inner and outer region formed by a pattern of conductive elements, said inner and outer regions covering the full surface of said cathode;

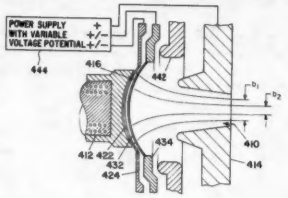
a second, further control grid located beyond said first, close-in control grid having an inner and outer region formed by a pattern of conductive elements;

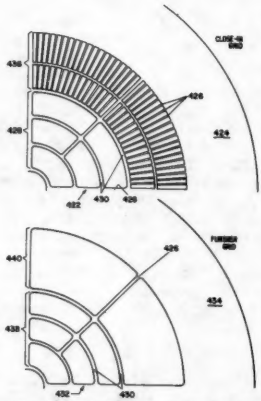
means for establishing voltage potentials for said dual-mode operation including a high and low mode;

said conductive elements in said outer region of said first, close-in control grid being more spacially dense than said conductive elements in said outer region of said second, further control grid;

said conductive elements in said inner and outer regions of said second, further control grid formed with a pattern which is matched by said conductive elements in said first, close-in control grid and aligned, from said cathode, behind said conductive elements in said first, close-in control grid as to be blocked from said cathode by said first, close-in control grid; and

means for establishing a negative voltage potential on said inner and outer regions of said first, close-in control grid during said low mode of operation wherein said first, close-in control grid acts as a shadow grid for said second,





further control grid and improves the laminar flow of electrons from said cathode to said anode.

4,593,231

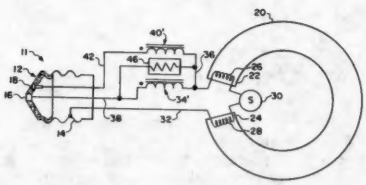
THREE-WAY FLUORESCENT LAMP DEVICE

Robert W. Wisbey, Arlington Heights, and Joseph S. Droho, Chicago, both of Ill., assignors to Advance Transformer Co., Chicago, Ill.

Filed Apr. 9, 1984, Ser. No. 598,521

Int. Cl.[4] H05B *39/00*

U.S. Cl. 315—100 **59 Claims**



1. A multiple level gas discharge lamp starting and operating system capable of producing three different levels of light, respectively, from a preheatable cathode fluorescent lamp, said fluorescent lamp including a starter means connected in series between two cathode filaments, said starter means providing a closed circuit during the preheating of the cathode, said system suitable for operation at line voltage when said system is energized in one of a LOW, MED or HIGH mode from a three-

way incandescent lamp socket connected to an A.C. source of power, comprising:

A. an incandescent lamp three-way base for connection to said socket;

B. ballast means connecting the fluorescent lamp to said base and having at least one first reactor connected exclusively to carry operating current to said lamp in one of said LOW and MED modes, said first reactor having a value selected to limit the operating current of said one mode to a value below the starting current level required for starting the lamp;

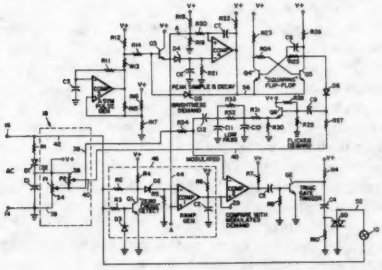
C. passive circuit element means connected between said lamp and base and in parallel operating relation to at least said first reactor for switching a portion of the lamp starting current to by-pass said first reactor for a period sufficient to enable starting said lamp at the beginning of said one mode, and thereafter, switching operating current of said mode through only said first reactor; and

D. means for directing the portion of the lamp starting current passing through said passive circuit element means in said by-pass condition through the cathode filament and starter means of said lamp in series to provide current sufficient to preheat the cathode and start the lamp.

4,593,232
FLAME SIMULATING APPARATUS

Timothy K. McEdwards, 1040 W. MacArthur Blvd., #17, Santa Ana, Calif. 92707

Filed Jan. 20, 1984, Ser. No. 572,539
Int. Cl.[4] G05F *1/00*; H05B *41/36, 37/02, 39/04*
U.S. Cl. 315—199 **33 Claims**



1. In an apparatus for connection to an alternating current power source to simulate a flame emission, the combination comprising:

at least one electrical lamp device;

a controllable switching device in series relation with said at least one lamp device, said switching device being controllable into conduction through a given phase angle of an alternating current pulse;

means for gating said switching device;

comparator means for controlling said gating means;

a first input means to said comparator means, said first input means providing a time-proportional signal synchronized to begin at the approximate time of passage of the source voltage waveform through zero;

a second input means to said comparator, said second input means providing a generally random pulse-width modulated amplitude controlled input;

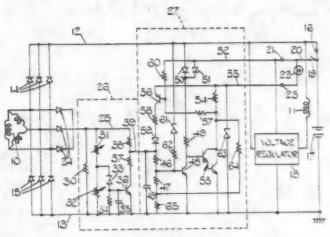
first variable signal control means coupled to the power source and in circuit relation with second input means for providing a first control signal for controlling the average intensity of said input; and

second variable signal control means coupled to receive said first control signal and in circuit relation with said second input means for providing a second control signal for controlling the amplitude of said input of said second input gating means to control said switching device into conduction through the so-selected phase angle to control energy from the power source to said lamp device to simulate a flame or to function as a light dimming control system.

4,593,233
LAMP DRIVE CIRCUIT

Joseph D. F. Taylor, Worcestershire, and David Wiley, Staffordshire, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 9, 1982, Ser. No. 396,559
Claims priority, application United Kingdom, Jul. 24, 1981, 8122857
Int. Cl.[4] G05F *1/00*; H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—307 **6 Claims**



1. A lamp drive circuit comprising a first supply input for connection to a first supply rail, a second supply input for connection to a second supply rail, a control input for receiving a control signal, a lamp output for connection to one side of a warning lamp, switch means and a current measuring resistor connected in series between the lamp output and the second supply input, a capacitor connected between the control input and the second supply input so as to be charged via the control input, the voltage across the capacitor controlling the state of the switch means so that the switch means is non-conductive when the capacitor is charged, and voltage sensitive means responsive to the voltage drop across the current measuring resistor and arranged to charge the capacitor in the event of the voltage drop exceeding a predetermined value and thereby rendering the switch means non-conductive, the capacitor subsequently discharging until the switch means is again rendered conductive, whereby the switch means is driven repetitively non-conductive and conductive thereby preventing the mean current through the switch means exceeding an excessive value.

4,593,234
PROGRAMMABLE APPARATUS FOR CONTROLLING ILLUMINATING LAMPS

Jerry S. C. Yang, 5-1 Tay Pyng St., Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Filed May 11, 1982, Ser. No. 377,170
Int. Cl.[4] H02B *1/08*
U.S. Cl. 315—362 **19 Claims**

1. An apparatus for controlling at least on illuminating lamp comprising:

illuminating lamp means for producing illumination in response to a signal applied thereto;

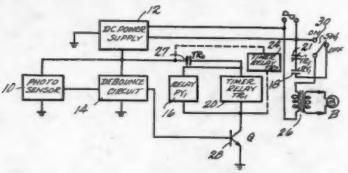
light sensing means for generating a first output signal when the illumination produced by a light source has fallen below a predetermined level;

storage means for storing said first output signal;

first timing means for generating a second output signal a first predetermined time after said storage means stores said first output signal;

switching means for supplying a signal to said illuminating

lamp means beginning when said second output signal is generated by said first timing means so long as said first output signal is also present; and



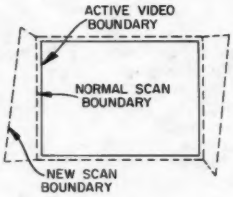
second timing means for removing said signal from said illuminating lamp means after a second predetermined period of time has elapsed since said first timing means first generates said second output signal.

4,593,235

APPARATUS AND METHOD FOR ELIMINATING VIDEO SHADING EARS

Hazem Nabulsi, Santa Clara, and Donald D. Kline, Cupertino, both of Calif., assignors to Panavision, Inc., Tarzana, Calif.

Filed Aug. 29, 1983, Ser. No. 527,387
Int. Cl.[4] H01J *29/52*
U.S. Cl. 315—381 **16 Claims**



1. A video camera comprising a camera tube that has a target on which an electric charge pattern is created representative of an optical image, that has an electron gun, including a lens electrode, for generating a focused electron beam, and that has deflection means for causing said beam to trace successive scan lines, with line retrace therebetween, over a normally scanned area of said target in order to modify said charge pattern, whereby the charge pattern within an active video area of said target may be converted to a video signal, and wherein undesired electric charges build up at areas beyond the ends of said scan lines of said normally scanned area, said camera being characterized in the provision of means for applying a voltage pulse to said lens electrode, the timing, amplitude, duration, and shape of said pulse being predetermined to cause the electron beam to scan beyond the ends of scan lines of said normally scanned area and thereby to erase said undesired electric charges.

4,593,236

REGULATION DEVICE FOR THE ROTARY DRIVE OF A SUPPLY ROLL DEVICE, ESPECIALLY A WARP BEAM OF A WEAVING MACHINE

Gerhard Oesterle, Koblach, Austria, and Wilhelm Hutter, Roggwil, Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Sep. 24, 1984, Ser. No. 653,557
Claims priority, application Switzerland, Oct. 4, 1983, 5393/83
Int. Cl.[4] B65H *59/38*
U.S. Cl. 318—7 **7 Claims**

1. A regulation device for a rotary drive of a supply roll device, especially for a warp beam of a weaving machine, for generating as uniform as possible a tension force upon a material being let-off in the form of warp threads and conducted to a further processing device and to a fabric take-up device, comprising:

a tachometer coupled with said rotary drive;

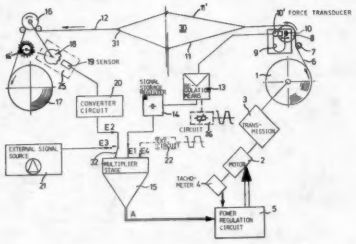
a drive motor of said rotary drive;

a power regulator connected to said drive motor;

said tachometer serving as a momentary value transducer for said power regulator;

first means for generating a first electrical signal corresponding to said tension force in said material being let-off in the form of warp threads;

second means for generating a second electrical signal in correspondence to a take-up speed of the fabric woven from the warp threads;



a multiplier stage connected to said first and second means and delivering an output signal;

said first and second electrical signals being input to said multiplier stage;

said output signal being conducted to said power regulator as a reference value for the rotary drive;

regulation means;

signal storage means connected with said regulation means;

said multiplier stage having a warp tension input;

said first means for generating said first electrical signal comprising a swingingly supported sensor roll engaging said material being let-off in the form of warp threads and a force transducer; and

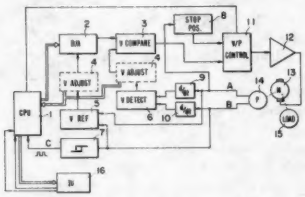
said force transducer being connected through said regulation means and said signal storage means to said warp tension input of said multiplier stage.

4,593,237

SERVO-SYSTEM HAVING AN ADJUSTMENT INDICATOR

Hidetake Tanaka, Tokyo, Japan, assignor to Ricoh Company Ltd., Japan

Filed Nov. 4, 1983, Ser. No. 549,249
Claims priority, application Japan, Nov. 6, 1982, 57-195181
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **11 Claims**



1. An adjustable servo-system capable of adjusting the operating time of its servo-motor, comprising;

setting means for setting the operating time of said servo-system in a stepwise fashion over a predetermined range;

operating means responsive to said setting means for operating said servo-motor in accordance with the operating time determined by said setting means, said operating means, when activated by a test switch, causing said servo-motor to once move to a predetermined position and detecting a currently set operating time which is currently set in said setting means and calculating an average operating time of said servo-motor by repreatedly operating said servo-motor over a predetermined number of times under said currently set operating time, thereby determining a difference between said currently set operating time and said average operating time to obtain an optimum operating time of said servo-motor on the basis of said difference; and

means for indicating said optimum operating time to an operator.

4,593,238

METHOD AND APPARATUS FOR CONTROLLING TRAVEL OF AN AUTOMATIC GUIDED VEHICLE

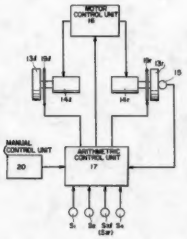
Kenzo Yamamoto, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Sep. 6, 1984, Ser. No. 647,993

Claims priority, application Japan, Sep. 17, 1983, 58-171736

Int. Cl.[4] G05D *1/00*

U.S. Cl. 318—587 **4 Claims**



1. A method for controlling travel of an automatic guided vehicle to make said automatic guided vehicle travel along a route from a start point to an objective point and stop at said objective point, comprising the steps of;

detecting a distance of said travel from said start point of said automatic guided vehicle toward said objective point;

comparing said detected distance with a predetermined distance, said predetermined distance being shorter than the distance between said start point and said objective point;

detecting by at least one sensor a mark located at said objective point; stopping said automatic guided vehicle when said mark is detected on and after the occurrence of said comparing result.

4,593,239

METHOD AND APPARATUS FOR CONTROLLING TRAVEL OF AN AUTOMATIC GUIDED VEHICLE

Kenzo Yamamoto, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Sep. 6, 1984, Ser. No. 647,995

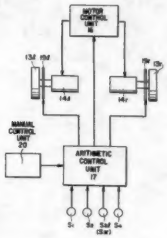
Claims priority, application Japan, Sep. 17, 1983, 58-171737

Int. Cl.[4] G05D *1/00*

U.S. Cl. 318—587 **5 Claims**

1. A method for controlling travel of an automatic guided vehicle to make said automatic guided vehicle travel along a route from a start point and pass by a plurality of points in order and stop at a predetermined point, comprising the steps of:

detecting marks located at said plurality of points by at least three sensors provided on said automatic guided vehicle and counting the number of marks detected, respectively, by each of said sensors;



adopting a number which represents a majority among said counted numbers of marks from each of said sensors as a reference value in accordance with the logic of majority;

correcting any of said counted numbers which does not equal said reference value.

4,593,240

METHOD AND APPARATUS FOR DETERMINING THE FLUX VECTOR OF A ROTATING-FIELD MACHINE FROM THE STATOR CURRENT AND THE STATOR VOLTAGE, AND THE APPLICATION THEREOF

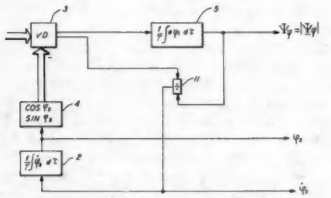
Felix Blaschke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,828

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319350; May 18, 1984, 3418641

Int. Cl.[4] H02D *5/40*

U.S. Cl. 318—800 **29 Claims**



1. In a method for determining the flux vector of a rotating field machine from the stator current and the stator voltage comprising the following steps:

(a) forming the EMF vector of the machine from measured values of the current and voltage;

(b) modifying the EMF vector by means of a feedback signal derived from the determined flux vector; and

(c) forming the flux vector by integration of the modified EMF vector, the improvement comprising, the following steps:

(d) defining the modified EMF vector with first and second orthogonal EMF components in a rotating coordinate system;

(e) forming the magnitude of the flux vector by integration of the first rotating EMF component;

(f) forming the quotient of the second EMF component and the magnitude of the flux vector, said quotient representing the rotational frequency of said flux vector;

(g) integrating said quotient to form an angle signal representing the angle of rotation of the rotating coordinate system and the angular direction of the flux vector; and

(h) using said angle signal as the feedback signal for modifying the EMF vector.

4,593,241
HALL GENERATOR CIRCUIT WITH TEMPERATURE COMPENSATION

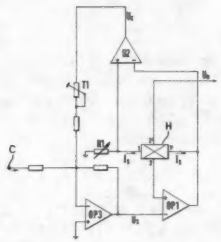
Hannspeter Eulenberg, Aachen, Fed. Rep. of Germany, and Horst Larue, Kerkrade, Netherlands, assignors to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,424

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322942

Int. Cl.[4] G01R *33/06*

U.S. Cl. 323—294 **10 Claims**



1. A Hall generator circuit using a Hall generator with a positive temperature coefficient (TK) of the resistance of the drive current path with temperature compensation which comprises:

a Hall generator having a drive-current path having a drive-current input terminal, a drive-current output terminal, and a signal voltage path having a pair of signal voltage terminals;

a substantially temperature-independent resistox (R1) connected in series with said drive-current path and to said drive-current input terminal;

differential amplifier means having inputs connected respectively to said drive-current input terminal and said drive-current output terminal, and an output at which a temperature-compensating voltage appears;

summing amplifier means for summing said control voltage and at least one other voltage in the form of a constant voltage and producing an output voltage; and

an operational amplifier having inputs connected respectively to the output of said summing amplifier means and to one of said signal-voltage terminals of said Hall generator, and an output connected to the drive-current output terminal for compensating for temperature drift of said Hall generator of a Hall voltage detected at the other signal voltage terminal.

4,593,242
CONTROL CIRCUIT FOR A DELAYED SWEEP OSCILLOSCOPE

L. Rodney Bristol, Tigard; Alfred K. Hillman, Jr., Portland, and William Q. Law, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 26, 1983, Ser. No. 545,560

Claims priority, application Japan, Nov. 19, 1982, 57-202230

Int. Cl.[4] G01R *13/22*

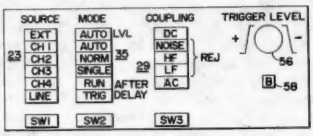
U.S. Cl. 324—121 R **4 Claims**

1. A control circuit for an oscilloscope having a normal sweep circuit and a delayed sweep circuit, comprising:

electronic control means for selecting at least one of a trigger source and a coupling from a plurality of trigger sources and couplings;

indicator means for indicating the selected setting of said electronic control means;

switch means for enabling said electronic control means to control the setting for the normal sweep circuit and for the delayed sweep circuit; and



memory means coupled to said electronic control means and to said indicator means for storing the settings selected by said electronic control means.

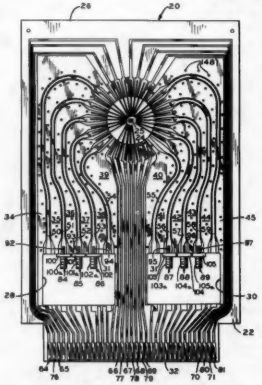
4,593,243
COPLANAR AND STRIPLINE PROBE CARD APPARATUS

Binneg Y. Lao, Rancho Palos Verdes, and David A. Rowe, Redondo Beach, both of Calif., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Aug. 29, 1984, Ser. No. 645,429

Int. Cl.[4] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **28 Claims**



27. In a probe card for coupling signals to an IC chip placed beneath the card and having a planar dielectric substrate; a plurality of coplanar flat elongated conductors each having first and second joined longitudinal sections and said conductors each having first and second ends; each said conductor first end being at a first edge of said substrate and each said conductor second end being at a second edge of said substrate; at least first, second and third of said coplanar conductors being coplanar mounted to one side of said substrate; said second conductor being a signal conductor and being between said first and third conductors and being laterally spaced and electrically insulated from said first and third conductors along the entire length of said second conductor; said first end of each of said first and third conductors conductively connected to an electrical ground; the improvement comprising:

first means for conductively connecting said first end of said second conductor to a signal line;

a plurality of elongated planar conductive blades each having joined first and second longitudinal sections and each of said blades having first and second ends;

second means for conductively connecting said first section of each of said plurality of blades to a longitudinal second section of each of said first, second and third conductors,

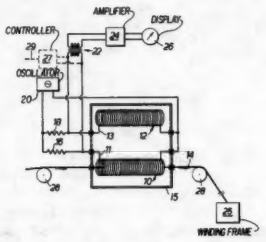
respectively; the plane of each of said plurality of blades being substantially perpendicular to the plane of said substrate; said blade second sections each having an angular pitch relative said substrate.

4,593,244

DETERMINATION OF THE THICKNESS OF A COATING ON A HIGHLY ELONGATED ARTICLE

Warwick R. Summers, New Lambton Heights, and Rodney C. Cross, Abbotsford, both of Australia, assignors to Australian Wire Industries Pty. Ltd. and John Lysaght Australia Limited, both of Sydney, Australia

Filed Aug. 4, 1983, Ser. No. 520,148
Claims priority, application Australia, Aug. 6, 1982, PF5249
Int. Cl.[4] G01B *7/10*; G01R *33/12*
U.S. Cl. 324—230 **25 Claims**



1. A method for facilitating the determination of the thickness of a coating on a highly elongated article having a ferromagnetic core of nominal diameter, wherein the coating envelops the core, is electrically conductive, and has a substantially lower magnetic permeability than the core, characterized by:

relatively moving the article longitudinally through a non-tunable, inductively wound hollow wire coil while applying to said coil an alternating electrical current of constant frequency less than 140 kHz, said current and frequency chosen to avoid magnetic saturation of the core;

monitoring an electrical property of the coil in a non-tunable circuit and deriving a signal or other indication representative of the monitored electrical property; and

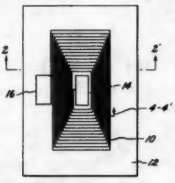
producing a direct indication of the thickness of the coating from the signal derived from the monitored electrical property of the coil.

4,593,245

EDDY CURRENT METHOD FOR DETECTING A FLAW IN SEMI-CONDUCTIVE MATERIAL

John R. M. Viertl, and Mederic E. Auger, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,214
Int. Cl.[4] G01N *27/90*; G01R *33/12*
U.S. Cl. 324—238 **8 Claims**



1. A method for detecting a flaw in a surface and/or sub-surface region of a semi-conductive material, the semi-conductive material including a conducting material disposed in the sub-surface region at a predetermined distance from the surface of the semi-conductive material, comprising the steps of:

providing a continuous run of metal configured spiral-like on a substantially planar insulative substrate as a unilaminar coil;

exciting said coil to produce an electromagnetic field extending from said coil, the electromagnetic field for inducing eddy currents in the surface and/or sub-surface region of the semi-conductive material when said coil is positioned adjacent said semi-conductive material;

establishing a reference signal corresponding to the impedance of said coil when said coil is adjacent an unflawed region of said material;

juxtapositioning said coil adjacent the surface and/or sub-surface region of the semi-conductive material to induce an electromagnetic field therein, while inhibiting induction of eddy currents in the conducting material; and

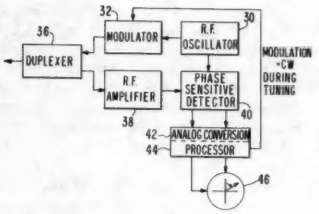
comparing a signal representative of the impedance of said coil during said juxtapositioning step with said reference signal to provide an output signal indicative of the integrity of said surface and/or sub-surface region of the semi-conductive material, whereby the flaw in the surface and/or sub-surface region of the semi-conductive material may be detected.

4,593,246

NMR TUNING PROCEDURE

Howard D. Hill, Cupertino, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 12, 1984, Ser. No. 650,324
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **4 Claims**



1. A method of adjusting a variable impedance RF probe of a quadrature sensitive Fourier transform NMR spectrometer, comprising the steps of:

(a) directing a continuous wave RF signal to a network including a terminating fixed impedance of known characteristic in place of said variable impedance RF probe,

(b) obtaining and storing the amplitude of said signal affected by said terminating fixed impedance,

(c) detecting in quadrature and storing the phase of said affected signal in relation to the phase of said transmitted signal, whereby a first impedance vector is derived and retained,

(d) replacing said fixed terminating impedance with said variable impedance RF probe,

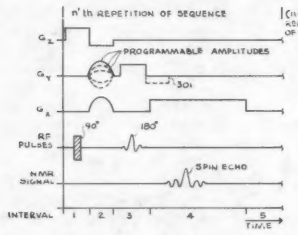
(e) next directing a continuous wave RF signal to said variable impedance RF probe, obtaining and storing the amplitude of said signal affected by said variable impedance RF probe and detecting in quadrature and storing the phase of said variable impedance RF probe affected signal in relation to the phase of the continuous wave RF signal applied thereto to obtain a second impedance vector characterizing the presence of said variable impedance probe, and

(f) altering the amplitude and phase of the signal affected by said variable impedance RF probe by varying electrical parameters of said probe to minimized a function of said first and second impedance vectors.

4,593,247
METHOD OF NMR IMAGING WITH OFF-CENTER ZOOM SCAN

Gary H. Glover, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 25, 1983, Ser. No. 555,097
Int. Cl.[4] G01R *33/22*
U.S. Cl. 324—309 13 Claims



1. A method of producing NMR images free of aliasing artifacts, comprising the steps of:

(a) positioning an object to be imaged in a homogeneous magnetic field directed along a first axis of said object;

(b) exciting to resonance a plurality of nuclear spins in a predetermined region of said object;

(c) applying to said predetermined region at least one phase-encoding magnetic-field gradient, having one of a plurality of programmable amplitudes, which gradient is directed along at least one additional axis of said object;

(d) irradiating said object with a selective, inverting RF pulse in the presence of a first magnetic-field gradient to initiate the refocussing of nuclear spins in a portion of said predetermined region;

(e) allowing said nuclear spins in said portion to refocus in the presence of a second magnetic-field gradient to produce a spin-echo signal having a frequency dependence on position in the direction of said second gradient, said spin echo being phase limited in the direction of said first gradient;

(f) filtering said spin-echo signal to band limit the frequency content thereof to frequencies corresponding to those associated with said second gradient co-extensive with said portion;

(g) sampling said spin-echo signal at a sufficient rate to recover the maximum frequency in the filtered signal, prior to repeating said steps (b)–(f) for a different amplitude of said phase-encoding gradient; and

(h) Fourier analyzing said sampled spin-echo signals to obtain pixel image data for reconstructing an image of said object portion which is free of aliasing artifacts.

4,593,248
OXYMETER

James S. Hyde, Dousman, Wis.; Wojciech Froncisz, Cracow, Poland, and Ching-San Lai, Wauwatosa, Wis., assignors to The Medical College of Wisconsin, Inc., Milwaukee, Wis.

Filed Mar. 27, 1984, Ser. No. 593,900
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—317 10 Claims

1. An instrument for measuring the oxygen concentration in a sample material, the combination comprising:

a standard material of known oxygen concentration;

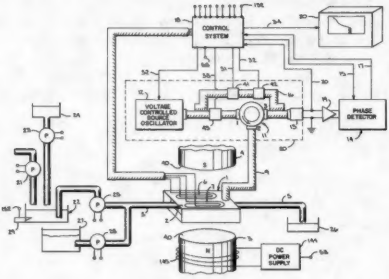
means for concurrently applying a polarizing magnetic field to the sample material and the standard material;

means for modulating the strength of the polarizing magnetic field at a reference frequency;

means for concurrently applying a source magnetic field to the sample material and the standard material at a frequency which produces paramagnetic resonance in free radicals contained in the sample material and the standard material;

means coupled to the last named means for sensing the signal produced by the resonating free radicals in both the standard material and the sample material;

means coupled to the last named means for detecting the dispersion component of each sensed signal to produce a first



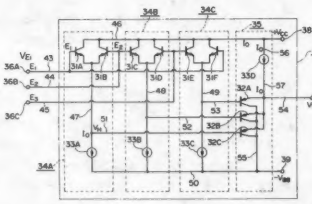
reference frequency signal having a phase determined by the oxygen concentration in the sample material and a second reference frequency signal having a phase determined by the oxygen concentration in the standard material; and

processor means coupled to the last named means for comparing the phases of the first and second reference frequency signals and producing a signal indicative of the oxygen concentration in the sample material.

4,593,249
MIDDLE VALUE SELECTION CIRCUIT

Setsuo Arita, Hitachi, and Takao Sato, Toukai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 512,000
Claims priority, application Japan, Jul. 13, 1982, 57-122561; Jan. 12, 1983, 58-2168
Int. Cl.[4] H03K *17/62*
U.S. Cl. 328—137 13 Claims



1. In a middle value selection circuit which consists essentially of three first selection means for receiving mutually different combinations of two analog signals among three input analog signals and selecting and producing either one of the greater or smaller signal of said two analog signals and second selection means for receiving as an input signal the output signals of said first selection means to produce a signal representative of a minimum value of the input signals when said first selection means selects said greater signals and a signal representative of a maximum value of the input signals when said first selection means selects said smaller signals, the improvement wherein said first and second selection means are composed of semiconductor devices and there is further provided constant current means for supplying a constant current for said first and second selection means so that an error component resulting from the semiconductor devices of said first selection means and included in the signal from said first selec-

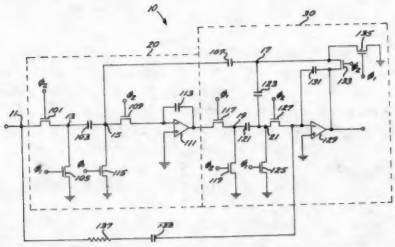
tion means is complementary to an error component caused by the semiconductor device of said second selection means and said error components have stable values in spite of variations in the values of said input signal, wherein each of said first selection means consists of a pair of semiconductor devices in the form of transistors of a first conductivity type and a first constant current circuit connected in common to said pair of semiconductor devices, and said second selection means consists of three semiconductor devices in the form of unidirectionally conductive elements of a second conductivity type and a second constant current circuit connected to each of said semiconductor devices of said second conductivity type, said first and second conductivity types being complementary to each other said first constant current circuit producing a current whose magnitude is twice the magnitude of the output current of said second constant current circuit.

4,593,250

OPERATIONAL AMPLIFIER COMPENSATION TECHNIQUE FOR BIQUADRATIC NOTCH ACTIVE FILTERS

Charles H. Lucas, Newport Beach, and James H. Mulligan, Jr., Santa Ana, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 26, 1985, Ser. No. 769,291
Int. Cl.[4] H03F *1/32*
U.S. Cl. 330—107 **12 Claims**



1. An active notch filter comprising:

first integrating means including at least one operational amplifier responsive to an input signal for integrating the input signal to provide a first integration signal;

second integrating means responsive to said first integration signal for providing a filter output; and

feed forward means in parallel with said first integrating means for providing a current signal for tending to cancel the current signal of said first integration signal, said feed forward means including means for compensating the effects of current lag introduced by said at least one operational amplifier of said first integrating means, whereby said compensating means substantially increases the attenutation of the active notch filter at the notch frequency.

4,593,251

POWER AMPLIFIER CAPABLE OF SIMULTANEOUS OPERATION IN TWO CLASSES

Randall C. Smith, 1317 Ross St., Petaluma, Calif. 94952

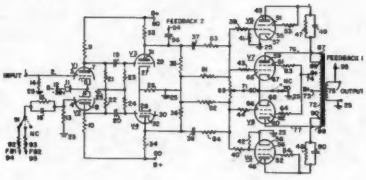
Division of Ser. No. 489,915, Apr. 29, 1983, Pat. No. 4,532,476, which is a continuation of Ser. No. 278,717, Jun. 29, 1981, abandoned. This application May 7, 1985, Ser. No. 731,411
Int. Cl.[4] H03F *3/26*
U.S. Cl. 330—123 **12 Claims**

1. An amplifier, primarily for audio power musical instruments and sound reproduction systems including:

(a) at least two pairs of electron discharge devices, each device having an input elecrtrode and an output electrode, each said pair of electron discharge devices being arranged in a push-pull configuration;

(b) means connecting each of said output electrodes to a common utilization device;

(c) first input impedance means coupled to one said pair of electron discharge devices for causing said one pair of electron discharge devices to operate in Class A; and



(d) second input impedance means having a lower impedance than said first input impedance means coupled to the other said pair of electron discharge devices to cause said other pair of electron discharge devices to operate in Class AB,

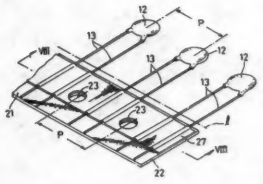
(e) said first means and second means including means arranged to cause continuous operation of said one pair of electron discharge devices in Class A when said other pair of electron discharge devices is driven into saturation.

4,593,252

ENHANCED TRANSCONDUCTANCE AMPLIFIER

Thomas H. Korn, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed May 3, 1984, Ser. No. 608,648
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—260 **10 Claims**



8. An amplifier circuit having an improved gain-bandwidth product, said amplifier circuit comprising in combination:

(a) a first amplifying stage including an operational amplifier with capacitive feedback to an input thereof;

(b) a transconductive circuit having a first terminal coupled to a load device and to said input of said first amplifying stage, and a second terminal coupled by means of a feedback resistor to an output of said first amplifying stage;

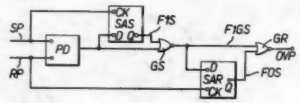
(c) a gain-setting resistor coupled to said feedback resistor, and forming a junction therewith for setting the gain of said amplifier circuit; and

(d) a second amplifying stage having a first input coupled to an input of said amplifier circuit, an output coupled to an input of said transconductance circuit, and a second input coupled to the junction of said gain-setting resistor and said feedback resistor, whereby the effective transconductance of said transconductance circuit is enhanced enough to make the effective transconductance of said amplifier circuit approximately proportional to the closed loop gain of said amplifier circuit both at low and at very high closed loop gains.

4,593,253
FLIP-FLOP PHASE DETECTOR CIRCUIT FOR PHASE LOCKED LOOP

David J. McCabe, and Geoffrey W. Sumerling, both of Northampton, England, assignors to Plessey Overseas Limited, Ilford, England

Filed Sep. 28, 1984, Ser. No. 655,695
Claims priority, application United Kingdom, Oct. 29, 1983, 8328951
Int. Cl.[4] H03D *13/00;* H03L *7/08*
U.S. Cl. 331—1 A 4 Claims

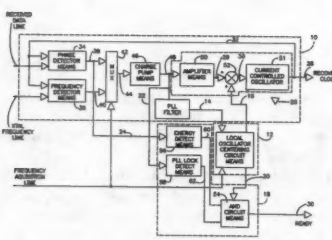


1. A phase detecting arrangement for use in a frequency and phase synchronising system, said arrangement comprising a phase detector having an inherent delay characteristic and arranged to produce alternate logic 1 and logic 0 outputs in response to the arrival at respective phase detector inputs of set and re-set pulse transitions occurring in pulse trains derived, respectively, from external synchronising signal generating means and signal source means the frequency of which is to be synchronised with that of the synchronising signal, in which first and second sampling devices are associated with the phase detector for sampling the output from the detector when set and re-set transitions occur, respectively, at inputs to the first and second sampling devices and in which outputs from the sampling devices are suitably gated to produce an overall logic 1 or logic 0 output from the arrangement whereby an existing output (i.e. logic 1 or logic 0) from the arrangement is perpetuated when the phase detector output sampled indicates that at least two consecutive set or re-set pulse transitions have occurred without the intervention of an opposite type transition (i.e. re-set or set).

4,593,254
VCO CENTERING CIRCUIT

Ronald L. Coburn, Fuquay-Varina, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 14, 1984, Ser. No. 681,767
Int. Cl.[4] H03L *7/08*
U.S. Cl. 331—1 A 8 Claims



1. A circuit arrangement for automatically biasing a VCO so that an output frequency f_o is being positioned at the center frequency f_c of the VCO, said circuit arrangement comprising:

a counting means operable for storing a digital count and for providing an adjustable signal for driving the VCO until the output frequency f_o is being positioned at the center frequency f_c;

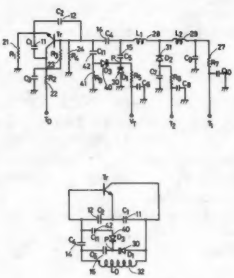
first means operable for monitoring an output signal from the VCO and for generating an error signal with said error signal operable for adjusting the digital count if said output signal falls outside of a predetermined signal range; and

clock means operable for stepping the counting means.

4,593,255
VARACTOR TUNED COLPITTS OSCILLATOR WITH COMPENSATING VARACTOR FOR WIDE BAND WIDTH

Syuuji Matsuura, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1983, Ser. No. 470,960
Claims priority, application Japan, May 17, 1982, 57-83691
Int. Cl.[4] H03B *5/12*
U.S. Cl. 331—117 R 1 Claim



1. An oscillation circuit includes as its principal components Clapp capacitor means, amplifier means, two feedback capacitor means connected to each other and resonance coil means, said oscillation circuit comprising:

first variable-capacitance diode means;

first capacitor means, to form first series circuit including the first variable-capacitance diode means and the first capacitor means, is connected in parallel with the resonance coil means;

second variable-capacitance diode means;

second capacitor means to form second series circuit including the second variable-capacitance diode means and the second capacitor means; and

means for applying a voltage to enable the first and the second diode means,

wherein one end of the second diode means of the second series circuit is connected to the first diode means such that a certain polarity terminal of the second diode means is faced against the same polarity terminal of the first diode means, and one end of the second capacitor means of the second series circuit is connected with the feedback capacitor means connected to the Clapp capacitor means.

4,593,256
OSCILLATOR WITH SWITCHED REACTANCE RESONATOR FOR WIDE BANDWIDTH AND SERIAL BIAS CONNECTIONS FOR LOW POWER

Robert H. Bickley, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1984, Ser. No. 625,744
Int. Cl.[4] H03B *5/00, 5/04, 5/12;* H03L *1/00*
U.S. Cl. 331—117 R 17 Claims

1. An oscillator comprising:

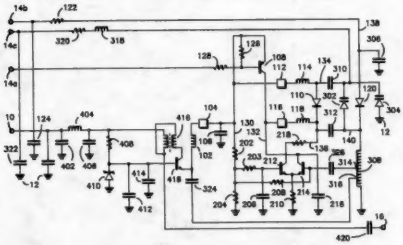
means for supplying an amplifier biasing current;

an amplifier having an input for receiving feedback and an output for energizing an oscillation signal relative to a common potential so that the oscillation signal oscillates within a range of frequencies less than a maximum frequency of oscillation, said amplifier being biased by the amplifier biasing current of said supplying means;

a resonator comprising a plurality of reactive impedance

devices, said resonator being coupled to the amplifier input and to the amplifier output; and

a switching section comprising a first PIN diode having ON and OFF modes, the first PIN diode being coupled to said amplifier and to said resonator so that when the first PIN diode is in the ON mode the amplifier biasing current of



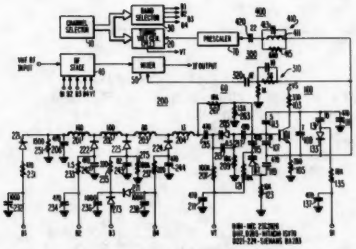
said supplying means flows through the first PIN diode and said resonator exhibits a first resonant frequency, and when the first PIN diode is in the OFF mode the first PIN diode electrically switches one of the reactive impedance devices relative to said resonator so that said resonator exhibits a second resonant frequency.

4,593,257

MULTIBAND LOCAL OSCILLATOR

Leroy S. Wignot, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 705,495
Int. Cl.[4] H03B *5/00;* H04N *5/50*
U.S. Cl. 331—117 R **14 Claims**



1. In a tuning system for a television receiver, a local oscillator capable of oscillating throughout a relatively wide frequency range including a plurality of frequency bands comprising:

a transistor having first and second electrodes connected to ends of controllable current path and a control electrode for controlling the current flowing in said current path, said transistor being configured as an amplifier with said first electrode coupled to a source of operating voltage and said second electrode coupled to a source of reference potential;

means for conditioning said amplifier to oscillate throughout said frequency range;

a variable capacitance element;

a plurality of inductors coupled in series;

a source of band selection signals;

a plurality of switch means coupled to respective ones of said inductors for selectively coupling said inductors in a tuned circuit with said variable capacitance means in response to respective ones of said band selection signals;

means for coupling said tuned circuit to said control electrode;

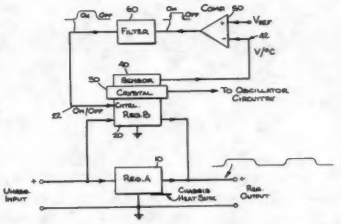
means coupled to said conditioning means for disabling said amplifier from oscillating in a predetermined one of said bands when another predetermined one of said bands is selected for tuning in response to the band selection signal corresponding to said selected band.

4,593,258

ENERGY CONSERVING APPARATUS FOR REGULATING TEMPERATURE OF MONITORED DEVICE

Gerald Block, 45 Chirstopher St., New York, N.Y. 10014

Filed Feb. 13, 1985, Ser. No. 701,092
Int. Cl.[4] H03L *1/04*
U.S. Cl. 331—176 **9 Claims**



1. Apparatus for controlling the temperature of a device whose temperature is to be stabilized within a preset range comprising:

first power supply regulator means coupled to a source of unregulated voltage and having a first regulated output voltage at an output thereof;

second power supply regulator means coupled to said source of unregulated voltage and having a second output voltage at an output thereof, said output of said first and second regulator means being coupled together, said device whose temperature is to be stabilized being coupled to one of said regulator means so that heat generated by the one of said regulator means is dissipated in said device;

temperature sensing means coupled to said device for generating a first signal proportional to the temperature of said device; and

means coupled to said sensor means for generating a second signal when the temperature of said device is outside the preset range, one of said regulator means having a control imput responsive to said second signal whereby the heat generated by the regulator means to which the device is coupled and dissipated in said device may be controlled.

4,593,259

WAVEGUIDE LOAD HAVING REFLECTING STRUCTURE FOR DIVERTING MICROWAVES INTO ABSORBING FLUID

Lowell J. Fox, San Carlos, and John Dimeff, San Jose, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 27, 1983, Ser. No. 517,603
Int. Cl.[4] H01P *1/26*
U.S. Cl. 333—22 F **29 Claims**

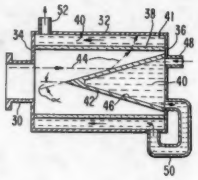
13. A microwave load for accepting microwave power, comprising:

an outer container having an opening means for communicating with an ouptut of a hollow waveguide;

dielectric window means including a hollow dielectric chamber in the form of a figure of revolution about an axis entirely within said outer container;

means for filling a microwave absorbing fluid between an

outer surface of said hollow dielectric chamber and said outer container;



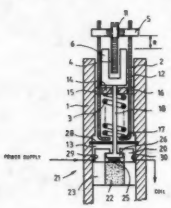
and means within said hollow dielectric chamber for reflecting received microwave power through said window means into the microwave absorbing fluid.

4,593,260

CONTACT WITH A MAGNETIC COMPENSATOR

Jean P. Guero, Bezons, and Guy H. Lacan, Maisons Laffitte, both of France, assignors to La Telemecanique Electrique, France

Filed Feb. 1, 1985, Ser. No. 697,199
Claims priority, application France, Feb. 3, 1984, 84 01665
Int. Cl.[4] H01H *3/00, 75/00, 53/00*
U.S. Cl. 335—195 **15 Claims**



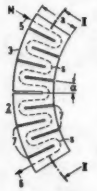
1. A contact equipped with a magnetic compensator with automatic self-disconnection from a compensating force threshold, this contact comprising at least two fixed contacts and a mobile contact bridge actuated by a switching assembly and having at least two mobile contacts which are applied respectively, under the effect of a spring, to the two fixed contacts in the closed position of the contactor, the connection between the mobile contact bridge and the switching assembly being provided by means of a magnetic compensator generating a compensation force tending to apply the mobile contacts on the fixed contacts under the effect of a current passing through the mobile contact bridge and this against the action of the repellent forces which are then exerted between these contacts, wherein the connection between the magnetic compensator and the switching assembly is provided by a magnetic coupling device adapted so that when said compensating forces rise above a predetermined threshold, the magnetic compensator is disengaged from the switching assembly and becomes inoperative and consequently a very sudden variation of the resultant repellent force exerted at the level of the contacts is obtained with very rapid opening of the contactor to the frankly open position.

4,593,261

DEVICE FOR COOLING A MAGNET SYSTEM

Helmut Forster; Karl-Georg Heinzelmann, both of Neunkirchen; Horst Siebold, and Jürgen Vetter, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,105
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404457
Int. Cl.[4] H01F *5/00*
U.S. Cl. 335—300 **14 Claims**



1. A cooling device for a magnet system, which comprises several annular magnet coil windings made from ribbons of normal conducting material and having two annular end faces comprising, at each end face of said windings:

(a) a predetermined number of identical cooling elements uniformly distributed over the circumference of the end face, each cooling element comprising at least one heat conduction plate having the shape of an annular sector and provided with a predetermined number of slots uniformly distributed in the circumferential direction;

(b) a coolant line, adapted to conduct a forced flow of cooling medium, connected over several turns in a heat conducting manner to each heat conduction plate; and

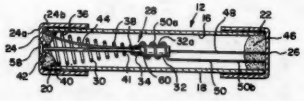
(c) adhesive cementing said cooling elements to the end faces of said coil windings over large areas in a heat conducting manner.

4,593,262

TIME DELAY INDICATOR FUSE

David J. Krueger, Arlington Heights, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Mar. 22, 1985, Ser. No. 715,097
Int. Cl.[4] H01H *85/04, 85/30*
U.S. Cl. 337—163 **9 Claims**



1. A fuse for protecting a circuit, said fuse comprising a fuse housing, a first and a second conductive terminal in the housing for connection with an external circuit, serially-located elements disposed within said fuse housing and providing electrical continuity between said terminals, said elements including stressed spring means and resistor means, said spring means having a proximate end secured to said first terminal and a distal end secured through a meltable junction to said resistor means so that said junction holds said spring means in tension, said resistor means having an insulating outer body portion in heat transfer relation to said meltable junction, said resistor means further being in electrical parallel relation with a conductive path which includes heating means and which provides short circuit protection and which is isolated from the tension of said spring means, said conductive path being of a substantially lower resistance than that of said resistor means so that most of the current normally flows through said path,

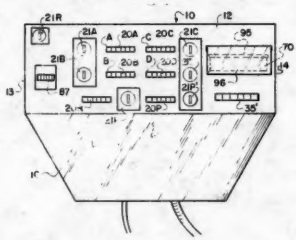
said heating means generating heat upon flow of current therethrough and being proximate to one of said resistor body means and metlable junction so that the meltable junction is directly or indirectly heated thereby, wherein under prolonged overload conditions which are to blow the fuse said meltable junction melts to collapse the spring and disconnect said heating means and resistor means from one of the terminals, and wherein under short circuit conditions, a part of said conductive path melts to open the path to thereby shift all resulting circuit current to said resistor means, which then heats up to melt said meltable junction and causes said spring to collapse and disconnect said resistor means from one of said terminals.

4,593,263

MILEAGE RECORDING AND SERVICE REMINDING ACCESSORY FOR A SHARED-USE VEHICLE

Ralph H. Peckworth, 1241 Rollins Ave., Charlotte, N.C. 28205

Filed Jul. 29, 1983, Ser. No. 518,812
Int. Cl.[4] G01D *9/00*; B60Q *1/00*
U.S. Cl. 340—52 D **4 Claims**



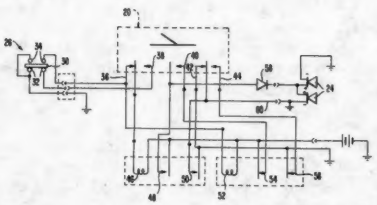
1. A shared-use vehicle having a master meter responsive to cumulative use of the vehicle and also having a group of auxiliary meters each of which is selectively operable to register only the use of the vehicle by a specific person, said shared-use vehicle including an additional electric odometer controlled by two switches in series with each other and with the said additional odometer, whereby the combined use of selected ones of the group of auxiliary odometers and of the additional car pool odometer enables the breakdown of commuting trips into private and car pool portions.

4,593,264

TRAILER HITCH SIGNALING DEVICE

Edgar R. Engle, 26 Scrafford St., Shippensburg, Pa. 17257

Filed Oct. 19, 1983, Ser. No. 543,275
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—52 R **1 Claim**



1. A dual warning alarm system for use with a trailer hitch having a trailer socket coupling member and a ball attached to a towing vehicle, said ball member in use being adapted to be received by said trailer socket coupling member for coupling a trailer to said towing vehicle, the improvement comprising:

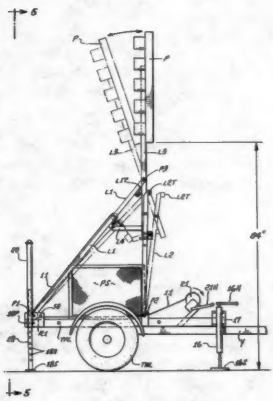
said ball member having an interior hollow chamber and a smooth watertight exterior surface, power supply means and ground; alarm signal means; a magnetic switch mounted in said hollow chamber and in series with said alarm signal means, said magnetic switch including first normally open and second normally closed pairs of fixed contacts and a moveable magnetic contact for bridging said pairs of fixed contacts, first circuit means connecting a first relay coil, including a first normally open relay contact in series with said first pair of normally open fixed magnetic contacts between said power supply and ground, second circuit means connecting said alarm signal means with said second normally closed fixed magnetic contacts and a second relay contact, in use said first normally open fixed magnetic contacts being bridged by said moveable magnetic contact energizing said first relay coil closing said first normally open relay contacts de-energizing said alarm signal means when said ball and socket coupling member are connected, said alarm signal means being energized upon de-energizing of said first relay coil upon disconnection of said ball and said socket coupling member; third circuit means including a second relay coil, having a third normally open relay contact, in series with said first normally open fixed magnetic contacts, said power supply and ground, said third normally open relay contact in series with said alarm signal means whereby loss of ground of said second relay coil completes a circuit through said power supply means and said alarm signal means.

4,593,265

PORTABLE TRAFFIC CONTROL APPARATUS

John D. McKenney, South Laguna, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 5, 1983, Ser. No. 539,137
Int. Cl.[4] B60Q *1/24*
U.S. Cl. 340—114 B **26 Claims**



1. A traffic controller comprising a supporting frame structure, dual symmetrically arranged linkage means pivotally secured to the frame structure for movement relative to the supporting frame structure, arrow display means secured to said linkage means to be responsive to the movements thereof to move between substantially vertical and substantially horizontal positions, control means coupled to said linkage means for uniformly moving said linkage means to selectively move the arrow display means between said positions and maintain the display means in a preselected position, and compression spring means carried by said linkage means to engage the linkage means and to be compressively seated thereto when the linkage means are moved to place the display means in a prese-

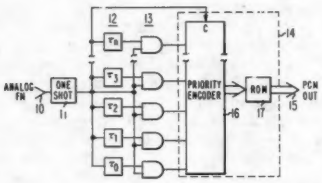
lected display position at or adjacent said vertical position, the compression spring means automatically functions to move the display means a preselected distance away from said preselected position when the securing means is released and prior to when the linkage means are controllably moved away from said preselected display position.

4,593,266

ANALOG-TO-DIGITAL CONVERTER/DEMODULATOR FOR FM SIGNALS

Richard C. Palmer, Blawenburg, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 8, 1983, Ser. No. 521,453
Int. Cl.[4] H04L *27/14*
U.S. Cl. 340—347 AD **11 Claims**



1. A digital converter of phase/frequency modulated analog signals comprising:

means responsive to zero crossings of said analog FM signals for generating pulses of uniform pulsewidth, which pulses are narrow relative to the period between said zero crossings;

delay means responsive to said pulses for providing n delayed replicas of said pulses, which replicas are delayed by ascending delay periods, the periods increased by predetermined increments;

a plurality of pulse coincidence detection means coupled to said means for generating pulses and responsive to said pulses and respective delayed replicas, for generating detection signals on the simultaneous occurrence of said pulses from the pulse generating means and a delayed replica of said pulses; and

a DECODER responsive to detection signals from said coincidence detection means for providing digital manifestations corresponding to the periods between successive pulses.

4,593,267

DIGITAL DATA CODE CONVERSION CIRCUIT FOR VARIABLE-WORD-LENGTH DATA CODE

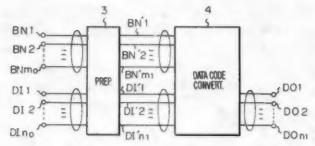
Hideo Kuroda, Yokosuka; Naoki Mukawa, Yokohama; Kiichi Matsuda, Kawasaki; Toshihiro Honma, and Hiroshi Fukuda, both of Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Filed Jun. 30, 1983, Ser. No. 509,398
Claims priority, application Japan, Jun. 30, 1982, 57-111445; Jun. 30, 1982, 57-111446
Int. Cl.[4] H03K *13/24*
U.S. Cl. 340—347 DD **5 Claims**

1. A digital data code conversion circuit for variable-word-length data codes, comprising:

a data code conversion portion for converting first variable-word-length data codes having a word-length less than or equal to the first predetermined number into fixed word-length data codes having a word-length equal to the first predetermined number by dividing and combining the first variable-word-length data codes; and

a preparation circuit, operatively connected to and preceding said data code conversion portion, for dividing a second variable-word-length data code, received at a data input rate, having a word-length greater than the first predetermined number and less than or equal to a second predetermined number into the first variable-word-length data codes each having a word-length less than or equal to the first predetermined number and producing word-length information for the first variable-word-length data codes, said data code conversion portion being operated at an operation rate proportional to the data input rate multiplied by the second predetermined number and divided by the first predetermined number.

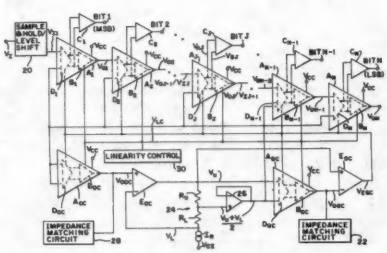


4,593,268

ANALOG-TO-DIGITAL CONVERTER USING ABSOLUTE-VALUE CONVERSION

Robert A. Blauschild, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 22, 1983, Ser. No. 468,720
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD **16 Claims**



1. A device for converting an analog signal into a digital signal in which each of a chain of main absolute-value differential amplifiers designated sequentially as the first amplifier through the last amplifier produces an output signal by amplifying the absolute value of the voltage difference between a pair of input signals of which one is a mainline signal and the other is a reference signal, the analog signal is the mainline signal to the first amplifier, the output signal of each amplifier except the last amplifier is the mainline signal to the next amplifier, and comparing means generates the digital signal by determining whether the mainline signal to each amplifier exceeds its reference signal, characterized by a gain-control system comprising:

an auxiliary absolute-value differential amplifier matched to the main amplifiers which are matched to one another for likewise producing an auxiliary output signal from a pair of input signals; and

gain-control feedback means responsive to the voltage difference between the auxiliary output signal and a baseline signal substantially the same as the auxiliary output signal when the gain of the auxiliary amplifier is at a desired gain for generating a gain-control signal that controls a path back to the auxiliary amplifier to cause its gain to stabilize very near the desired gain and controls paths to the main

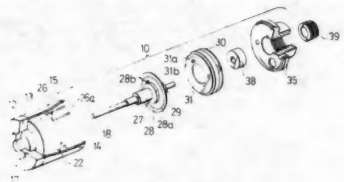
amplifiers to cause their gains to stabilize very near the desired gain.

4,593,269

COMPACT OPTIONAL ROTARY ENCODER HAVING ADJUSTABLE LIGHT ADMITTING AND RECEIVING COMPONENTS

Yoshimitsu Nakamura, Settsu; Kazuhisa Takahashi, Shijonawate, and Kazuhiro Mishina, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 2, 1984, Ser. No. 667,807
Claims priority, application Japan, Nov. 15, 1983, 58-215304
Int. Cl.[4] G01D *5/34;* H03K *13/02*
U.S. Cl. 340—347 P **8 Claims**



1. An optical rotary encoder comprising:

a body including

a disc-shaped portion, and

a cylindrical portion projecting from said disc-shaped portion and defining a cavity, said cylindrical portion including slit means therethrough communicating with said cavity,

an end cap closing an end of said cylindrical portion remote from said disc-shaped portion,

a first bearing mounted centrally in said disshaped portion,

a second bearing mounted centrally in said end cap and being axially slidable therein,

axially adjustable retaining means for retaining said second bearing in said end cap and for eliminating axial play of said second bearing,

a detection shaft journaled in said first and second bearings,

light emitting means mounted in said body,

a rotary slit wheel fixed on said detection shaft within said cavity for rotation therewith, said rotary slit wheel including position signaling slits, and at least one original signaling hole, said slits and hole being arranged to oppose said light emitting means,

a stationary slit plate disposed within said cavity and including position signaling slits and at least one origin signaling hole, said slits and hole being arranged to oppose said light emitting means, said stationary slit plate opposes a side of said rotary slit wheel opposite said light emitting means such that said rotary slit wheel is disposed between said light emitting means and said stationary slit plate,

a printed circuit board disposed within said cavity and including light receiving means for receiving light from said light emitting means which has passed through said position signaling slits and said original signaling holes of said rotary slit wheel and stationary slit plate,

a block disc interposed between said stationary slit plate and said circuit board for interconnecting said stationary slit plate and said circuit board, said block disc including holes for admitting light from said position signaling slits and original signaling hole of said stationary slit plate,

said block disc, said stationary slit plate and said circuit board being interconnected as a unit for common rotational adjustment by means of an external force applied through said slit means of said cylindrical portion, to adjust the angular position of said unit relative to said rotary slit wheel, and

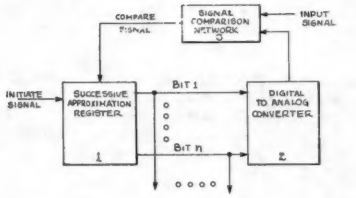
securing means for securing said unit in its adjusted angular positions.

4,593,270

SUCCESSIVE APPROXIMATION ANALOG TO DIGITAL CONVERTER

Robert White, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Jun. 19, 1984, Ser. No. 622,259
Int. Cl.[4] H03N *1/38*
U.S. Cl. 340—347 AD **16 Claims**



1. A successive approximation register for receiving an input signal, comprising:

a plurality of data latch circuits;

a plurality of flip-flop circuits, each of said flip-flop circuits coupled to a one of said data latch circuits, said plurality of flip-flop circuits adapted to activate said coupled data latch circuits in a sequential order, each of said activated data latch circuits providing a first signal to be applied to output terminals, said activated data latch circuit storing said first or a second signal in response to said input signal; and

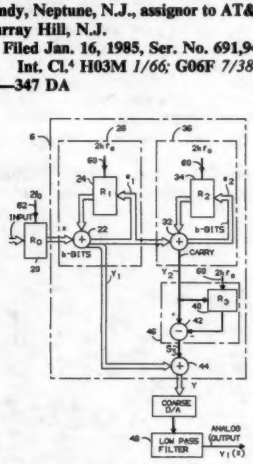
a master data latch circuit coupled to said plurality of data latch circuits, said master data latch circuit applying an output signal to said plurality of data latch circuits determined by said input signal.

4,593,271

HIGHER ORDER INTERPOLATION FOR DIGITAL-TO-ANALOG CONVERSION

James C. Candy, Neptune, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 16, 1985, Ser. No. 691,947
Int. Cl.[4] H03M *1/66;* G06F *7/38*
U.S. Cl. 340—347 DA **14 Claims**



1. An improved digital-to-analog converter comprising an input register for temporarily storing digital signals therein and for supplying said digital signals to a first accumulator for a first stream of most significant bits and the remaining bits as error bits, said first accumulator operating at a predetermined

rate faster than said input register and means for converting the digital signals to analog form, the improvement comprising

a second accumulator for receiving said error bits from said first accumulator as its input signal and for producing a second stream of most significant bits,

a digital circuit for differentiating said second most significant bits,

a binary adder for adding said most significant bits from said first accumulator and said second most significant bits from said second accumulator for producing a digital signal substantially free from truncation noise.

4,593,272

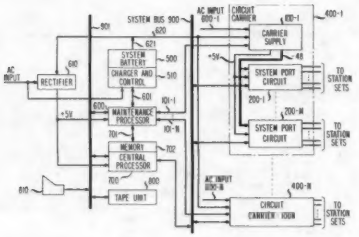
COMMUNICATION SYSTEM POWER ARRANGEMENT

Paul R. Berkowitz, Red Bank, N.J., assignor to AT&T Information Systems Inc., Middletown, N.J.

Filed Aug. 13, 1984, Ser. No. 639,723

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—500 **14 Claims**



1. A power monitoring arrangement for a communication system having a plurality of circuit carriers, said arrangement comprising,

means for receiving a power alarm generated by at least one of said circuit carriers, and

means responsive to said power alarm for providing an output if at least there was at substantially the time said power alarm was generated a substantial disparity between the level of traffic being processed by said one circuit carrier and the level of traffic being processed by at least one other of said circuit carriers.

4,593,273

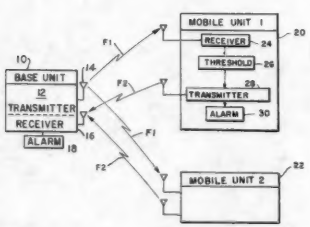
OUT-OF-RANGE PERSONNEL MONITOR AND ALARM

Bernadine O. Narcisse, 10366 Miller Ave., Cupertino, Calif. 95014

Filed Mar. 16, 1984, Ser. No. 590,325

Int. Cl.[4] G08B *1/08*; H04B *1/40*

U.S. Cl. 340—539 **13 Claims**



11. An out-of-range alarm system for generating an alarm whenever a mobile unit in the system extends beyond a prescribed limit from a base unit, said alarm system comprising;

a base unit including means for generating an omnidirectional first signal, means for detecting a second signal, and an alarm operative to produce an alarm signal upon the detection of said second signal; and

at least one mobile unit including means for detecting said first signal, threshold circuitry responsive to said detected first signal and operative to generate a threshold output signal when said first signal falls below a predetermined signal strength, and means coupled to said threshold circuitry for generating said second signal in response to said threshold output signal.

4,593,274

REMOTE SIGNALLING APPARATUS, PARTICULARLY SUITABLE FOR REMOTE SURVEILLANCE PURPOSES

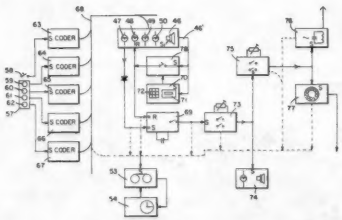
Corrado Rizzo, Montegrotto Terme, Italy, assignor to Veltronic S.p.A., Padua, Italy

Filed Feb. 15, 1984, Ser. No. 580,538

Claims priority, application Italy, Feb. 16, 1983, 84102 A/83

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—539 **18 Claims**



1. A remote signalling apparatus particularly suitable for remote surveillance purposes and characterized by comprising: a receiver (1) capable of receiving coded signals originating from a transmitter unit being provided with sensors for detecting the occurrence of events to be monitored, and further capable of providing alarm signals and signals indicating malfunction of said receiver and said transmitter unit associated therewith; and a fixed unit (43) for the supervision and operation of at least one said receiver coupled thereto, said fixed unit comprising:

a compartment (42) for housing, and mechanically locking therein, each said receiver;

personalized means for releasing a mechanical lock means (45) associated with said compartment and for mechanically locking said receiver unit into the said compartment;

optical and acoustic alarm indicator means (46) for indicating the occurrence of said signals indicative of a malfunction of each said receiver and respective transmitter unit and/or for indicating the occurrence of said coded signals received by each said receiver and originating from said respective transmitter;

means (76, 77) for remotely retransmitting the occurrence of the said alarm signals and said signals indicating malfunction;

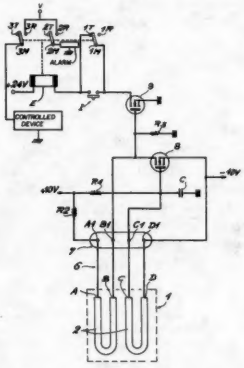
means (70) for recognizing an intended operator who is authorized to intervene following an indication by said fixed unit of a signal indicative of a detected event or malfunction relative to each said receiver, whereby recognition of said operator enables the remote retransmission of said occurrence of the said signals to be suspended; and

means (53, 54) for chronologically recording the occurrence of all of the indicated and signalled events of said apparatus.

4,593,275
SAFETY DEVICE FOR DETECTING A CONDUCTIVE LIQUID

Jourdain Kazandjoglou, Alunay /s/ Bois, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 5, 1983, Ser. No. 520,619
Claims priority, application France, Aug. 5, 1982, 82 13685
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—604 3 Claims



1. A safety device used in the detection of a conductive liquid in an enclosure to be monitored, in which the variation of the resistance as a result of the presence of the liquid between electrodes triggers an electrical alarm circuit, wherein it comprises in combination: a liquid detecting member constituted by two spaced electrodes and forming four contacts; a first field effect transistor, whose gate, source and drain terminals are connected to a power supply and to the four aforementioned contacts in such a way that the first field effect transistor is non-conducting when the conductive liquid is absent and where there is no deterioration to any one of the connections connecting the terminals of the first transistor to the said contacts; and a second field effect transistor, whose source and drain terminals are connected to a second power supply and whose gate terminals are connected to the drain terminal of the first field effect transistor in such a way that the second transistor is conductive under the aforementioned conditions in which the conductive liquid is absent and when there is no deterioration to one of the connections of the circuit, and supplies current to an alarm, signalling and control circuit of an enclosure to be monitored, the respective conduction and non-conduction states of the first and second field effect transistors being reversed when either one of the aforementioned conditions changes state.

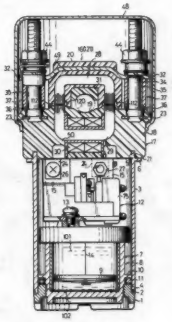
4,593,276
OVERCURRENT DISPLAY DEVICE

Mitsuo Aida, Komaki; Mitsuharu Kudomi, Konan, and Toshiyuki Adachi, Kakamigahara, all of Japan, assignors to Takamatsu Electric Works, Ltd., Aichi, Japan

Filed Dec. 22, 1982, Ser. No. 452,349
Claims priority, application Japan, Dec. 29, 1981, 56-215887
Int. Cl.[4] G08B 21/00; G01R 19/15
U.S. Cl. 340—664 14 Claims

1. An overcurrent display device comprising:

an overcurrent sensing circuit adapted to sense an overcurrent in a cable and to provide electric power due to the sensed overcurrent, said overcurrent sensing circuit including an overcurrent sensing current transformer to be placed around the cable and having outputs, a rectifying circuit connected to the outputs of the current transformer and having at least two outputs, a switching circuit adapted to permit electricity to pass therethrough only when a voltage at the outputs of the rectifying circuits is above a predetermined value, relay means including a main relay, a-contacts and b-contacts, said a-contacts being closed only when the main relay is energized, and said b-contacts being opened only when the main relay is energized, said main relay, switching circuit and one of the b-contacts being arranged in series and connected to the outputs of the rectifying circuit so that electricity temporarily passes therethrough only when a voltage at the outputs of the rectifying circuit is above a predetermined value, a zener diode connected parallel to the one of the a-contacts, and self-maintaining circuit connected at one end to a line between the b-contact and one of the outputs of the rectifying circuit through the one of the a-contacts and at the other end to a line between the main relay and the switching circuit so that after the b-contact opens due to the overcurrent, electricity is supplied to the



main relay through the a-contact and the self-maintaining circuit,

a drive unit including a drive element, said drive element being connected to the one of the a-contacts at one end and to a line between the main relay and the output of the rectifying circuit at the other end so that when the a-contact is closed, due to the overcurrent, the drive element operates, and

a display unit including a display tube, the inside of the tube being visible at least from below, a fluid stored in said tube and a display element situated in said tube and operationally connected to said drive element, an overcurrent condition being displayed as the result of actuation of said display element operated by said drive element, and a normal condition being displayed by said display element situated at a lower position under the influence of own gravity thereof and the viscosity of said fluid in a predetermined time.

4,593,277
APPARATUS AND METHOD FOR SENSING EXCESSIVE WEAR OR FAILURE OF MACHINE TOOL

John D. Langan, Goleta, Calif., assignor to Langan Engineering, Inc., Goleta, Calif.

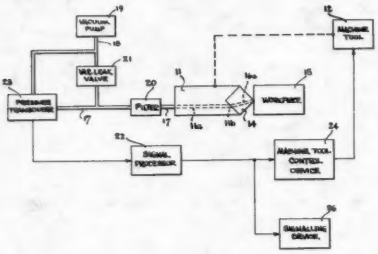
Filed Jan. 16, 1984, Ser. No. 570,793
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—680 15 Claims

1. In a machine tool having a tool holder and a tool which engages a workpiece to effect the machining thereof, said tool being mounted on said tool holder, the improvement whereby a control signal is generated indicating either the incipient failure or sudden total failure of said tool comprising

channel means formed in said tool holder, said channel means having an inlet orifice formed at the region of engagement between the tool and workpiece said orifice inletting air from the ambient atmosphere,

means for establishing an air stream entering the orifice in said channel means and running away from said region of engagement,

means responsive to said air stream for generating a signal in accordance with the pressure of said air stream, and



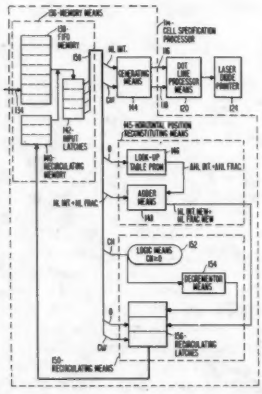
control means responsive to the last mentioned means for generating a control signal whenever the pressure of said air stream reaches a predetermined value.

4,593,278

REAL TIME GRAPHIC PROCESSOR

William M. Koos, Jr.; Timothy R. Geis, both of Orlando, and Richard M. Rudy, Jr., Longwood, all of Fla., assignors to Burroughs Corp., Detroit, Mich.

Filed Sep. 28, 1982, Ser. No. 425,206
Int. Cl.[4] G09G *3/20, 1/16*
U.S. Cl. 340—748 **10 Claims**



1. An apparatus to generate printed vector graphics, having initial processing which translates coordinate information from a host into cell specifications and orders said cell specifications by scan line of first appearance, said cell specifications having angle, cell height, cell width and integer and fractional horizontal location indicators, and having a real time processor to generate pixel date by processing said cell specifications on a scan line-by-scan-line basis, said real time processor comprising:

a memory means for storing said cell specifications and for latching, one at a time in sequence, each of said cell specifications which said latched cell specifications are being processed for a particular scan line;

a generating means, connected to said memory means, for generating pixel data from said latched cell specifications during a current scan line processing;

a horizontal position reconstituting means, connected to said memory means, for determining from said angle indicator of said latched cell specification, the horizontal location displacement for the next scan line, and for adding said horizontal location displacement to said horizontal location indicator to produce a new horizontal location indicator value; and,

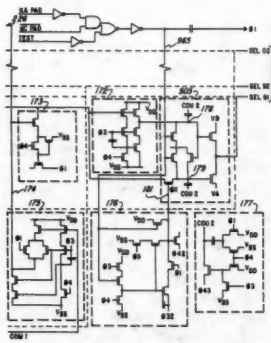
a recirculating means, receiving said angle, cell width, and cell height indicators from said memory means, and said new horizontal location indicator value from said horizontal positioning reconstituting means, for reconstructing a modified cell specification to be circulated back to said memory means for processing for the next succeeding scan line.

4,593,279

LOW POWER LIQUID CRYSTAL DISPLAY DRIVER CIRCUIT

Jerald G. Leach; Mohammed N. Maan, and Rakesh Pradhan, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 335,029, Dec. 24, 1981, abandoned.
This application Dec. 27, 1984, Ser. No. 685,967
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—811 **8 Claims**



1. A display driver circuit comprising:

first means for providing at least a timing signal;

second means for providing at least first and second voltage levels;

input circuit means for receiving data to be displayed;

segment output circuit means connected to said input circuit means for driving of display segments and including for each display segment an associated first switching means having an output alternating between the first and second voltage levels in response to corresponding data to be displayed and the timing signal to provide an output signal at an output node and thereby to the display segment associated with the first switching means;

display timing circuit means for providing time interval signal outputs connected to said display segments, said display timing circuit means includes second switching means that provide said time interval signal outputs by alternately connecting the first voltage level and second voltage level in response to the timing signal to the time interval signal outputs, wherein the first and second switching means each include first and second capacitors connected together in series at a node for receipt of the timing signal and having a first end and a second end, and first and second field effect transistors connected together in series between the first voltage level and the second voltage level having a common output node for connection to the display segments, the first end connected to the

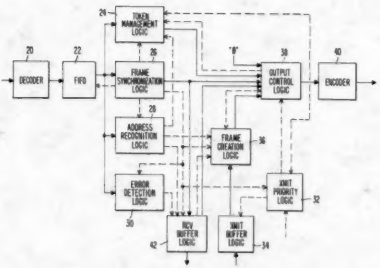
gate of the first field effect transistor and the second end connected to the gate of the second field effect transistor.

4,593,280

WRITE TOKEN REGENERATION IN A TIMED TOKEN RING

Robert M. Grow, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 355,021, Mar. 5, 1982, Pat. No. 4,404,577.
This application Jul. 26, 1982, Ser. No. 402,098
Int. Cl.⁴ H04Q *5/00*; H04J *3/06*
U.S. Cl. 340—825.05 **15 Claims**



1. In a loop communications network including a loop-connected set of stations providing data flow unidirectionally from one of said stations to the next, each of said stations being capable of passing data through itself along the loop, extracting data from the loop or injecting data into the loop, each of said stations having associated with it at least one individual address, the right of each of said stations to source new information into the network controlled by passing a write token from one of said stations to another, only one of said write tokens circulating around the loop under normal conditions, a method of generating said write token at initialization of said network or regenerating a lost write token, said method comprising the steps of:

each station measuring the time duration since the last receipt of said write token; and

in response to a first one of said stations detecting that said measured time duration exceeds a preset amount of time, said first one of said stations will initiate a bidding cycle to recover the write token.

4,593,281

LOCAL AREA NETWORK INTERFRAME DELAY CONTROLLER

Lawrence E. Lare, Cardiff-By-The-Sea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 13, 1983, Ser. No. 541,816
Int. Cl.⁴ H04Q *9/00*
U.S. Cl. 340—825.5 **1 Claim**

1. In data communications network having a plurality of information processing systems coupled to a communication channel which serially transmits data in the form of information packets at a first clock rate, a network controller disposed between said communication channel and an information processing system comprising:

a plurality of transceivers coupled to said communication channel, each transceiver including transmitting means for transmitting a signal onto said channel, and receiving means for receiving a signal communicated on said channel by another transceiver;

collision detecting means coupled to the transmitting means and the receiving means of each transceiver for generating a collision signal whenever a signal communicated on said channel by another transceiver is received by said receiving means during the time said transmitting means is transmitting a signal onto said communication channel;

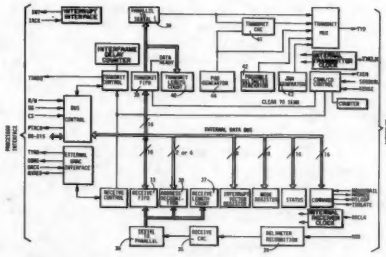
means connected to each transceiver and responsive to the presence of said collision signal for interrupting the transmission of a signal onto said channel by said transmitting means;

means connected to each transceiver and responsive to the presence of a carrier signal on said channel for preventing the transmission of a signal by said transmitting means;

an interface unit connected to said transceiver for transferring data in the form of information packets to and from said communication channel;

a serializer connected to said interface unit for converting data in said information packet to be transmitted on said channel from parallel form to serial form;

a transmit buffer connected to said serializer for storing in parallel form the data corresponding to a plurality of information packets to be transferred to said communication channel;



a first shift register having n bit positions including a first pointer bit, circulating at a first clock rate corresponding to the clock rate of data on said communication channel, where n is an integer corresponding to the number of memory locations in said transmit buffer, the location of said pointer bit with respect to said n bit positions in said first shift register corresponding to and pointing to the memory location in said transmit buffer wherein said data from said serializer is to be transferred to said communication channel;

a counter connected to said transmit buffer for controlling the release of packets from said transmit buffer according to a predetermined amount of time between the transmission of successive packets transferred from said transmit buffer to said communication channel; and

mode means connected to said counter for adjusting the predetermined amount of time determined by said counter from a first fixed value to a second fixed value.

4,593,282

NETWORK PROTOCOL FOR INTEGRATING SYNCHRONOUS AND ASYNCHRONOUS TRAFFIC ON A COMMON SERIAL DATA BUS

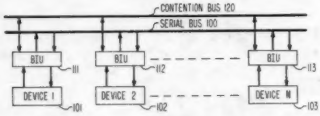
Anthony Acampora, Freehold; Michael G. Hluchyj, Red Bank, and Chan D. Tsao, Morganville, all of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Apr. 14, 1983, Ser. No. 485,034
Int. Cl.⁴ H04J *3/02*
U.S. Cl. 340—825.5 **35 Claims**

1. A technique for enabling a plurality of devices of initial and ongoing synchronous and asynchronous communication to gain access to time slots on a shared communication medium, each of said time slots occurring at a preselected frame rate, comprising:

assigning priority information to each device, representing a priority level associated with that device, said priority information including variable information,

granting access to a time slot by evaluating said priority information assigned to devices contending for that slot, wherein said assigning step is CHARACTERIZED BY forming said variable information as a function of (a) the synchronous or asynchronous nature of the communication desired by the device, and (b) the initial or ongoing status of said synchronous communication, wherein



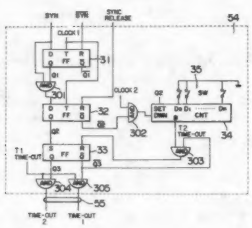
a higher one of said priority levels is assigned to ongoing synchronous communication and a lower one of said priority levels is assigned to initial synchronous communication, both as compared to the one of said priority levels assigned to asynchronous communication.

4,593,283

DATA COMMUNICATION SYSTEM WITH TIMED ACCESS TO LINK

Megumi Uchino, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,489
Claims priority, application Japan, Jun. 22, 1982, 57-107293
Int. Cl.[4] H04Q *9/00*; H04J *3/08*
U.S. Cl. 340—825.07 **6 Claims**



1. A data communication system including a high rank unit and a plurality of terminals connected in parallel to said high rank unit through the same communication line, for transmitting information through said communication line between said high rank unit and said terminals in accordance with a predetermined transmission control process in which a request is generated within a terminal to effect transmission of information on said communication line between the terminal and said high rank unit in response to a command inputted to the terminal and a first time-out signal is generated if the transmission of said information is not begun within a predetermined period following generation of said request, each of said terminals comprising:

(a) detection means connected to receive signals on said communication line for detecting whether a data communication has been established between said high rank unit and any terminal in order to determine whether or not the communication line is in operation;

(b) count means for carrying out a count operation with a predetermined timing following the generation of said request and when the result of detection of said detecting means indicates that said communication line is not in operation, and for generating a second time-out signal when a predetermined count is reached;

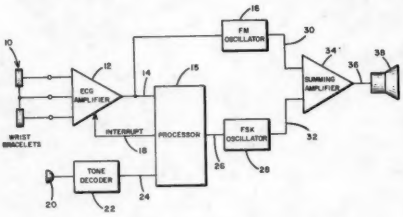
(c) status signal generating means connected to said detection means and said count means for generating a first status signal representing a line busy condition when said detection means determines that the communication line is in operation at the time of generation of said first time-out signal and for generating a second status signal representing a maintenance request when said first and second time-out signals are both generated.

4,593,284

ANALOG AND DIGITAL SIGNAL TRANSMITTER

Mark J. Clifford, New Brighton; Robert H. Hock, Brooklyn Center; Douglas M. Jagunich, Minneapolis, and Paul J. Robinson, St. Paul, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 14, 1984, Ser. No. 589,441
Int. Cl.[4] G08C *19/02*
U.S. Cl. 340—870.18 **4 Claims**



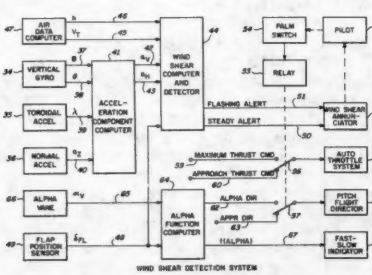
1. A transmitter for transmitting information derived from both analog and digital sources comprising analog signal input means, frequency modulated oscillator means modulated by said analog signal input means, digital signal input means, frequency shift keying oscillator means constructed to operate at a first frequency when said digital input signal means is supplying a digital signal at a first logic level and to operate at a second output frequency when said digital signal input means is at a second output logic level, and an amplitude output summing amplifier for summing together the output of said frequency modulated oscillator means and said frequency shift keying oscillator means.

4,593,285

WINDSHEAR DETECTION AND WARNING SYSTEM WITH EVASION COMMAND

Harry Miller, Scottsdale, and Terry L. Zweifel, Phoenix, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,085
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—968 **11 Claims**



5. Windshear detection and warning apparatus for an aircraft having flight control instrumentation responsive to normal

command signals for directing the aircraft along a predetermined flight path, said apparatus comprising

means responsive to signals which vary in accordance with the vertical and horizontal components of aircraft acceleration relative to the ground and relative to the sustaining air mass for providing windshear warning signals proportional to deviations in excess of a predetermined value between said vertical components of said ground and air mass acceleration signals and between said horizontal components of said ground and air mass acceleration signals,

means responsive to the angle of attack of the aircraft for providing a command signal corresponding to the maximum safe angle of attack of said aircraft,

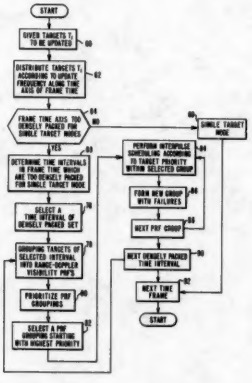
switching means for removing said normal command signal from said control instrumentation and for supplying said angle of attack command signal thereto, and

means responsive to said windshear warning signals for signalling the operation of said switching means, wherein said windshear warning signals further include a component proportional to the magnitude and rate of rotation of a resultant acceleration vector derived by the vector addition of said vertical and horizontal components of said ground acceleration signals.

4,593,286
METHOD OF OPERATING AN AGILE BEAM COHERENT RADAR

Bruce D. Mathews, Catonsville, and James H. Mims, Millersville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1983, Ser. No. 488,236
Int. Cl.[4] G01S *7/42, 13/72*
U.S. Cl. 343—7 A **8 Claims**



1. In an agile beam coherent radar, a method of time scheduling mode dwell times corresponding to a multiplicity of targets, displaced in angle, range and velocity, in a radar frame time without reducing the performance of said radar, said method comprising the steps of:

scheduling a plurality of said target mode dwell times to a common time interval of said radar frame time;

grouping the targets of said common time interval into a set of pulse repetition frequencies (PRF's) which make said targets visible in both ange and doppler;

prioritizing the PRF groupings of the set from a highest to a lowest priority;

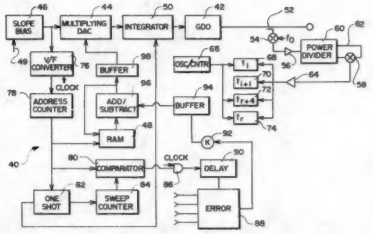
varying the PRF of the radar from the highest priority PRF to the lowest priority PRF of the set sequentially corresponding to the coherent integration times of the common time interval; and

interleaving the time event patterns of said targets of a PRF grouping for a coherent integration time in accordance with a predetermined rule to avoid eclipsing of the time events thereof, whereby data gathering from targets in multiple beam positions may be performed in a time conventionally used for a single line of sight of said radar.

4,593,287
FM/CW SWEEP LINEARIZER AND METHOD THEREFOR

John H. Nitardy, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 428,841
Int. Cl.[4] G01S *13/34*
U.S. Cl. 343—17.5 **16 Claims**



1. A sweep linearization network for an FM/CW radar system where in the transmitter sweep rate is subject to variation as a function of range, said network comprising:

a. sweep slope means providing a sweep slope signal controlling the sweep rate of the interrogation signal of an FM/CW radar transmitter;

b. accumulator/memory means having stored therein a plurality of sweep coefficients corresponding respectively to N discrete segments of an individual sweep of said interrogation signal;

c. driver means for developing a ramp signal establishing the sweep of said interrogation signal, receiving said sweep slope signal for controlling the slope of said ramp signal and said sweep slope coefficients for adjusting the slope characteristics of said ramp signal over each of said N sweep segments;

d. transmitter sampling means for developing a transmitter characteristic signal proportional to and indicative of said interrogation signal;

e. discriminator means for dividing said transmitter characteristic signal into a plurality of equal frequency excursion segments based upon a preselected reference amplitude thereof, to develop measured time signals proportional to and indicative of the frequency versus time relationship of said interrogation signal over each of said discrete signals;

f. timing means responsive to the sweep slope signal of said sweep slope means for establishing N equal time periods over the duration of a single sweep to provide comparison time signals;

g. processor means for comparing said measured time signal for a selected one of said sampling time segments with said comparison time signal to develop an error signal proportional to and indicative of any nonlinearity in said sweep over said time segment;

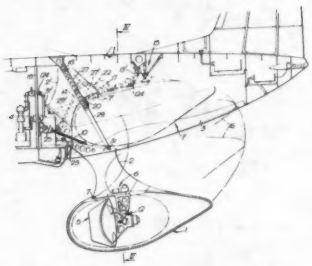
wherein said error signal is applied to said accumulator/memory means for updating the respective sweep slope coefficient thereby linearizing said sweep over the correlative time segment.

4,593,288

AIRBORNE EARLY WARNING SYSTEM WITH RETRACTABLE RADOME

Roger S. Fitzpatrick, Somerset, England, assignor to Marconi Avionics Limited, England

Filed Sep. 6, 1983, Ser. No. 529,650
Claims priority, application United Kingdom, Sep. 3, 1982, 8225158
Int. Cl.[4] H01Q *1/28*
U.S. Cl. 343—705 7 Claims



1. A radar scanner unit mounted in an aircraft having an elongated fuselage including means defining a first enclosed volume and means defining a second enclosed volume, said second enclosed volume being rearward of said first enclosed volume and being provided with a cargo-loading-aperture, said radar scanner unit comprising:

(a) a supporting framework fixed to said means defining said second enclosed volume;

(b) an aerodynamic pylon pivotally mounted for rotatable movement on and relative to said supporting framework about a first axis transverse to the axis of elongation of said fuselage, said pylon being pivotal between a deployed position in which it projects downwardly from the bottom of the fuselage and a retracted position in which it is received in the second enclosed volume;

(c) first drive means connected between said supporting framework and said pylon for effecting pivotal deployment and retraction of said pylon out of and into the means defining the second volume, respectively, through the cargo-loading-aperture;

(d) an aerodynamic radome pod pivotally mounted for rotatable movement on and relative to said pylon, said pod being elongated in a direction generally parallel to the direction of elongation of the fuselage;

(e) second drive means connected between said pylon and said radome pod for effecting pivotal deployment and retraction of said radome pod relative to said pylon about a second axis transverse to said fuselage;

(f) ganging means coupling said first and second drive means for deploying and retracting said pylon and said radome pod in unison;

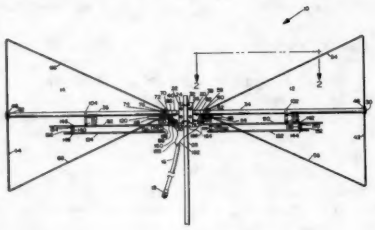
(g) said ganging means maintaining an approximately constant aerodynamic attitude of said radome pod as it is deployed through said cargo-loading-aperture out of said means defining said second enclosed volume and retracted through said cargo-loading-aperture into said means defining said second volume.

4,593,289

MULTI-BAND DIPOLE ANTENNA WITH MATCHING STUBS

Donald R. Newcomb, San Marcos, Tex., assignor to Butternut Electronics Co., Lockhart, Tex.

Filed Apr. 18, 1983, Ser. No. 485,875
Int. Cl.[4] H01Q *9/28*
U.S. Cl. 343—795 15 Claims



1. Apex fed opposing swept element antenna including:

a. cylindrical fiberglass support;

b. two central tubular elements telescoping over said support;

c. end elements substantially perpendicular to said central elements and mechanically and electrically affixed to ends of said central elements;

d. upper and lower swept elements including securing means for mechanically and electrically connecting each of said upper and lower swept elements between each of said end elements and said central elements at a junction at said support, end to end separation of said central tubular elements being less than one-half wavelength; and,

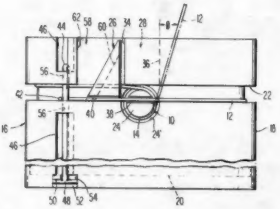
e. at least one stub means parallel to each of said central elements and electrically connected at each end of said stub means to each of said central elements and at a junction of said central elements.

4,593,290

COLLAPSIBLE ANTENNA ASSEMBLY

Edward A. Wojtowicz, Bryn Mawr, Pa., assignor to System Development Corporation, Camarillo, Calif.

Filed Mar. 2, 1984, Ser. No. 585,501
Int. Cl.[4] H01Q *1/34, 1/08*
U.S. Cl. 343—900 12 Claims



1. A collapsible antenna assembly comprising in combination:

a wire antenna having a straight section and a helical spring section integral therewith, the longitudinal axis of said straight section and the coil axis of said helical spring section being oriented transverse to each other,

a cylindrical support member for said antenna, said support member having a peripheral circumferential storage slot in proximity to an extremity thereof, a cavity formed in said support member and intersecting with said storage slot, a mounting projection disposed within said cavity, a

detent slot in the form of a circular sector, said detent slot being displaced from the periphery of said support member and extending from said extremity of the latter to said storage slot, an erection cam situated on the periphery of said support member and extending within said storage slot, said erection cam forming a portion of the wall defining said detent slot, an assembly slot formed in said last mentioned wall adjacent said erection cam,

said helical spring section of said antenna being disposed over said mounting projection such that said straight section assumes a preassembled generally erect position, said straight section entering said detent slot during assembly via said assembly slot, said straight section being rotated about said coil axis of said helical spring section and being wound around said support member within said storage slot, and

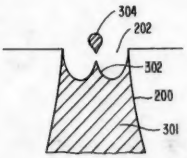
containment means for selectively restraining said straight section from unwinding from said storage slot and for releasing the same to permit it to reenter said detent slot in an erect operative condition.

4,593,291

METHOD FOR OPERATING AN INK JET DEVICE TO OBTAIN HIGH RESOLUTION PRINTING

Stuart D. Howkins, Ridgefield, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 16, 1984, Ser. No. 600,786
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **11 Claims**



1. A method for obtaining high resolution printing in operating an ink jet device having a chamber for containing ink, an orifice associated with the chamber, and transducer means coupled to said chamber, said transducer means being operable for selectively producing either an expansion or a contraction in the volume of said chamber, said method comprising the steps of:

(1) operating said transducer means to produce rapid expansion in the volume of said chamber; and

(2) maintaining said expanded volume for a period of time sufficient for rapidly pulling back into said chamber from said orifice a meniscus of ink for forming a cusp shaped disturbance of said meniscus, thereby causing a relatively small droplet of ink to form and break off form said meniscus, said droplet being ejected or propelled out of said orifice.

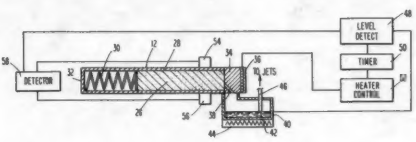
4,593,292

INK JET APPARATUS AND METHOD OF OPERATING INK JET APPARATUS EMPLOYING PHASE CHANGE INK MELTED AS NEEDED

Arthur M. Lewis, Ridgefield, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 15, 1984, Ser. No. 660,655
Int. Cl.[4] G01D *9/00, 15/16*
U.S. Cl. 346—1.1 **23 Claims**

1. A method of operating an ink jet apparatus comprising at least one ink jet, ink in the solid state, and a reservoir for receiving melted ink; the method comprising the following steps:



sequentially heating to a melting point and cooling different portions of the solid state ink on demand while continuously heating the reservoir; and

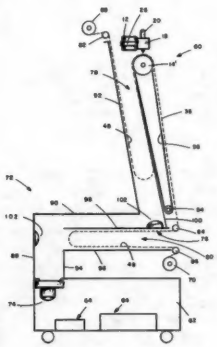
coupling the melted ink to the reservoir.

4,593,293

X, Y PLOTTER

Richard M. Higa, Downey, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 28, 1983, Ser. No. 536,488
Int. Cl.[4] G01D *15/28*
U.S. Cl. 346—136 **6 Claims**



1. A dual-mode X, Y plotter comprising:

(a) means for holding and moving a pen longitudinally along a first path in a plane in response to a first signal;

(b) means for holding and moving cut paper in contact with said pen longitudinally along a second path orthagonal to said first path in response to a second signal;

(c) means for holding and moving strip paper in contact with said pen longitudinally along said second path in response to said second signal;

(d) a driven roller longitudinally disposed parallel to said first path and with said pen in contact with the surface thereof, said roller being rotatable in response to said second signal; and,

(e) an idler roller disposed parallel to said driven roller; and wherein:

(i) said cut paper holding and moving means comprises a flat, endless belt wrapped around said driven roller and said idler roller and driven by said driven roller to move in combination therewith, said belt being adapted to have cup paper removeably attached to the surface thereof to be moved along said second path by said belt and said driven roller in combination in response to said second signal;

(ii) said strip paper holding and moving means comprises means carried by said driven roller for gripping and pulling strip paper along said second path in combination therewith in response to said second signal, and

(iii) said strip paper gripping and pulling means compris-

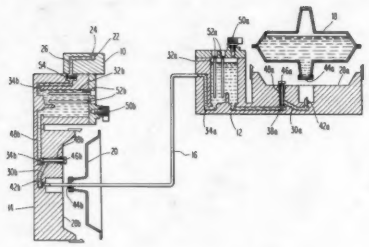
ing a pair of rows of first radial sprocket projections disposed adjacent respective ends of said driven roller and adapted to co-act with holes provided along the edges of the strip paper and a pair of rows of second radial sprocket projections disposed between said first projections and adjacent respective ends of said driven roller, said endless belt having holes adapted to receive and co-act with both said first and second projections whereby said belt is positively driven.

4,593,294

INK JET METHOD AND APPARATUS

Joseph P. Parisi, New Millford, Conn., assignor to Exxon Printing Systems, Inc., Brookfield, Conn.

Filed Apr. 22, 1985, Ser. No. 725,575
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **12 Claims**



1. Method of assembling ink handling modules for forming an ink jet system, said modules including a bubble trap chamber, an inlet to the chamber and an outlet from the chamber adapted to receive an ink jet head, said method comprising the following steps:

coupling a reservoir to the inlet of one module;

coupling the outlet from the one module to the inlet of another module;

coupling an ink jet to the outlet of the other module; and

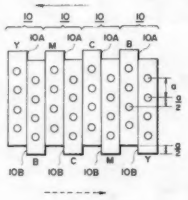
orienting said one module relative to said other module such that said bubble trap chamber of said one module is operative.

4,593,295

INK JET IMAGE RECORDING DEVICE WITH PITCH-SHIFTED RECORDING ELEMENTS

Yohji Matsufuji, and Hiroo Ichihashi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,437
Claims priority, application Japan, Jun. 8, 1982, 57-96931; Jun. 8, 1982, 57-96930
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **6 Claims**



1. An image recording device comprising:

at least two groups of ink-jetting orifices, each said group being arranged in a plurality of arrays of orifices for jetting inks of a like plurality of different colors, for recording a color image;

means for relatively moving the image recording device and a recording medium in a predetermined direction along which said arrays are disposed while a color image is recorded, wherein said groups are disposed in said arrays with a predetermined pitch and said arrays in one said group are shifted from said arrays in the other said group in a direction substantially normal to the predetermined direction; and

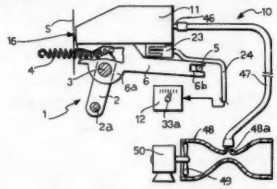
means for providing each said array in one said group with a different color ink.

4,593,296

INK JET PRINTER WITH GAS EVACUATING ARRANGEMENT

Giandomenico Dagna, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jul. 18, 1984, Ser. No. 631,950
Claims priority, application Italy, Jul. 20, 1983, 67783 A/83
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **12 Claims**



1. An ink jet printer including: a reservoir made of insulating material for an electrically conductive ink, at least one capillary nozzle communicating with said reservoir, a first electrode in contact with the conductive ink, a second electrode located at the outlet end of said nozzle and an electrical energization circuit for applying voltage pulses between the electrodes to cause an electric circuit in the ink of said nozzle, the density of said current in a portion of said nozzle having the smallest cross section being such as to create an instantaneous vaporization of part of said ink into the nozzle, which causes the ejection of ink droplets through the nozzle, and the introduction of the gas bubbles produced by said vaporization of said reservoir,

wherein the improvements comprise:

a chamber for collecting the gas so introduced into a reservoir, said chamber communicating with said reservoir through said aperture, and

means for evacuating the gas from said chamber.

4,593,297

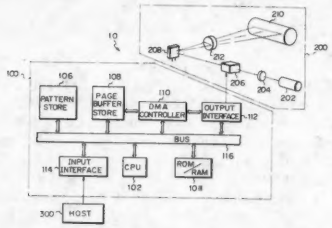
HALFTONE IMAGE RECORDING SYSTEM

Koichi Suzuki, Yokohama, and Noboru Murayama, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,203
Claims priority, application Japan, Jul. 20, 1983, 58-132187
Int. Cl.[4] G01D *15/14*; H04N *1/40, 1/21*
U.S. Cl. 346—160 **2 Claims**

1. In a halftone image recording system for an electrophotographic recording apparatus which records a halftone image of input image data by black dots and white dots, the improvement wherein a plurality of different densities are rendered on a two-dimensional dot matrix basis by using a plurality of different gradation density patterns, each of said gradation

density patterns being determined by a numer of at least either one of the black dots and white dots and a direction of arrangement of said one of the black and white dots in said two-dimensional dot matrix.



4,593,298

HEAT-SENSITIVE RECORDING PAPER

Kenji Ikeda; Takayuki Hayashi; Kensuke Ikeda, and Hiroharu Matsukawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 30, 1985, Ser. No. 771,077

Claims priority, application Japan, Aug. 30, 1984, 59-180916; Dec. 11, 1984, 59-261405

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—200 **20 Claims**

1. A heat-sensitive recording paper comprising a support having formed thereon a heat-sensitive recording layer containing a colorless or pale-colored electron donating dye precursor and an electron accepting substance that reacts with said electron donating dye precursor to develop color, and an overlying protective layer containing a water-soluble polymeric binder and a pigment, wherein the back side of the support is provided with a backcoat layer containing an alkali salt of a styrene-maleic acid copolymer.

4,593,299

Patent Not Issued For This Number

4,593,300

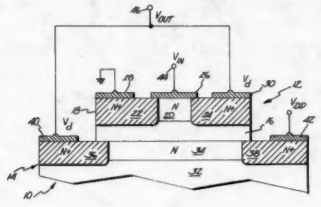
FOLDED LOGIC GATE

Michael Shur, Golden Valley, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 31, 1984, Ser. No. 666,897

Int. Cl.⁴ H01L *29/80, 29/78, 27/02, 29/56*

U.S. Cl. 357—22 **10 Claims**



1. A logic gate comprising:

a FET switching element having a first gate, a drain, a source and a channel of a first conductivity type;

a load element having a drain, a source and a channel of the first conductivity type, the source of the load element being located generally under the source of the FET switching element;

means for electrically connecting the source of the load element to the drain of the FET switching element; and

a low conductivity layer positioned between the FET switching element and the load element for separating and capacitively coupling the FET switching element and the load element so that the switching element acts as a gate for the load element and the load element acts as a second gate of the FET switching element.

4,593,301

HIGH ELECTRON MOBILITY SEMICONDUCTOR DEVICE EMPLOYING SELECTIVELY DOPED HETEROJUNCTION AND DUAL, UNDOPED SPACER LAYERS

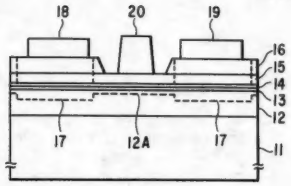
Tsuguo Inata, and Shigehiko Sasa, both of Isehara, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 1, 1985, Ser. No. 707,290

Claims priority, application Japan, Mar. 8, 1984, 59-44501

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **11 Claims**



1. High electron mobility semiconductor device comprising:

channel layer made from undoped gallium arsenide (i-GaAs) layer;

first spacer layer made from undoped aluminum gallium arsenide (i-$Al_xGa_{1-x}As$) layer fabricated contiguous to said channel layer;

second spacer layer made from undoped gallium arsenide (i-GaAs) layer fabricated contiguous to said first spacer layer; and

n-type aluminum gallium arsenide (n-$Al_xGa_{1-x}As$) layer fabricated contiguous to said second spacer layer;

wherein:

said second spacer layer has a thickness to prevent the diffusion of impurity from said n-type aluminum gallium arsenide layer to said channel layer;

said channel layer and first spacer layer are forming a heterojunction;

total thickness of said first and second spacer is thin enough to accumulate two dimensional electron gas (2DEG) in said channel layer close to said heterojunction.

4,593,302

PROCESS FOR MANUFACTURE OF HIGH POWER MOSFET WITH LATERALLY DISTRIBUTED HIGH CARRIER DENSITY BENEATH THE GATE OXIDE

Alexander Lidow, Manhattan Beach, and Thomas Herman, Redondo Beach, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

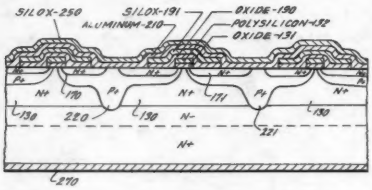
Filed Aug. 18, 1980, Ser. No. 178,689

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **14 Claims**

1. A high current MOSFET having low forward resistance comprising a semiconductor chip having first and second parallel surfaces; said chip having a body portion which is relatively lightly doped with impurities of a first conductivity type; said body portion extending from said first surface for at least a portion of the thickness of said chip; a plurality of local regions of a second conductivity type distributed over and extending into said first surface of said chip; a plurality of source regions of said first conductivity type extending into respective ones of said plurality of local regions and having a depth less than the depth of their said respective local region

and an outer periphery which is interior of and spaced by a fixed distance from the periphery of said local region at said first surface, thereby to define short conduction channels capable of inversion; each of said plurality of local regions being spaced from one another at said first surface by a symmetric mesh of said body portion; a mesh-shaped gate insulation layer extending over said mesh between said local regions and overlapping said short conductive channels surrounding said local regions; a mesh-shaped gate electrode disposed atop said gate insulation layer; a vertical conductive region of said first conductivity type extending from beneath said gate insulation



layer and between adjacent local regions and toward said second surface; a common source electrode connected to each of said source regions and to each of said local regions; said common source electrode extending over said first surface; and a drain electrode connected to said second surface; said vertical conductive region having a higher doping concentration than that of said body portion for a depth below said first surface which is less than the depth of said local regions; said doping concentration in said vertical conductive region having a constant value laterally across said first surface beneath said insulation layer.

4,593,303

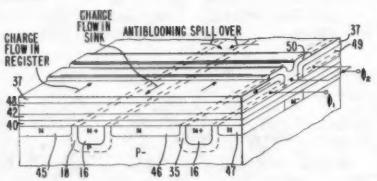
SELF-ALIGNED ANTIBLOOMING STRUCTURE FOR CHARGE-COUPLED DEVICES

Rudolph H. Dyck, and James M. Early, both of Palo Alto, Calif., assignors to Fairchild Camera & Instrument Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 589,844, Mar. 15, 1984, which is a continuation of Ser. No. 282,198, Jul. 10, 1981. This application Jul. 23, 1985, Ser. No. 758,563

Int. Cl.[4] H01L *29/78, 27/14, 31/00*

U.S. Cl. 357—24 **11 Claims**



1. An integrated circuit structure comprising:

a semiconductor substrate of first conductivity type, the substrate including a charge-containing region of opposite conductivity type for containing charge and from which charge in excess of a selected amount is to be removed;

a barrier region of first conductivity type more strongly doped than the substrate, the barrier region disposed in the substrate disposed adjacent the charge-containing region and extending into the substrate to a first depth for allowing charge in excess of a selected amount to pass through the barrier region; and

a charge sink region of opposite conductivity type disposed wholly within the barrier region for draining charge passing through that portion of the barrier region between the charge sink region and the charge-containing region, the charge sink region extending into the substrate a second depth less than the first depth and being separated from both the charge-containing region and the substrate by the barrier region.

4,593,304

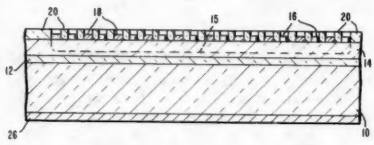
HETEROSTRUCTURE INTERDIGITAL HIGH SPEED PHOTOCONDUCTIVE DETECTOR

Charles W. Slayman, Newbury Park, and Luis Figueroa, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 255,597, Apr. 20, 1981, abandoned. This application Feb. 27, 1984, Ser. No. 559,509

Int. Cl.[4] H01L *29/14, 27/12, 29/48, 29/161*

U.S. Cl. 357—30 **13 Claims**



1. A high speed conductive detector responsive to incident optical radiation comprising:

(a) a substrate of semiconductor material;

(b) an isolation layer of semiconductor material formed on at least a portion of said substrate;

(c) an active layer of semiconductor material having a bandgap less than that of said semiconductor material comprising said isolation layer and supported on said isolation layer; and

(d) a pair of interdigited electrically conducting electrodes formed on a portion of the surface of said active layer so as to be in non-blocking contact therewith, at least one of said electrodes forming a Schottky-barrier contact with said active layer, the thickness of said active layer being approximately equal to or less than the spacing between said electrodes.

4,593,305

HETEROSTRUCTURE BIPOLAR TRANSISTOR

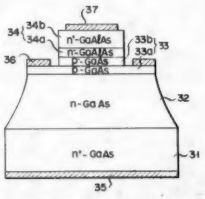
Mamoru Kurata, Tokyo, and Jiro Yoshida, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 8, 1984, Ser. No. 608,217

Claims priority, application Japan, May 17, 1983, 58-86063; May 17, 1983, 58-86069; May 17, 1983, 58-86072

Int. Cl.[4] H01L *29/72, 29/205*

U.S. Cl. 357—34 **9 Claims**



1. A heterostructure bipolar transistor comprising:

a collector layer of a first conductivity type;

a base multilayer of a second conductivity type which comprises first and second base layers sequentially formed on said collector layer, said first base layer constituting a junction with said collector layer, and an impurity con-

centration of said first base layer being higher than that of said second base layer; and

an emitter multilayer of the first conductivity type which comprises first and second emitter layers sequentially formed on said base multilayer, said emitter multilayer being formed of a semiconductor material whose energy gap is wider than that of said base multilayer, said second base layer constituting the heterojunction with said first emitter layer, and an impurity concentration of said first emitter layer being lower than that of said second emitter layer;

wherein the following relation is satisfied when the impurity concentration and the thickness of said first emitter layer are N_E and W_E, and the impurity concentration and the thickness of said second base layer are N_B and W_B, respectively:

$$N_E W_E^2/\epsilon_{sE} + N_B W_B^2/\epsilon_{sB} \leqq (2\epsilon_0/q)V_{bi}$$

where

q: absolute value of electron charge ($=1.6\times10^{-19}$ Coulombs)

ϵ_0: free space permittivity ($=8.86\times10^{-14}$ farads/cm)

ϵ_{sE}: dielectric constant of said first emitter layer

ϵ_{sB}: dielectric constant of said second base layer

V_{bi}: built-in potential at the heterojunction between said first emitter layer and said second base layer.

4,593,306

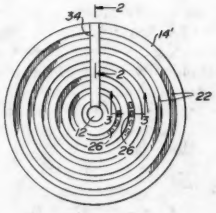
INFORMATION STORAGE MEDIUM AND METHOD OF RECORDING AND RETRIEVING INFORMATION THEREON

D. D. Marchant, Richland, Wash., and Stefan Begej, Amherst, Mass., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Feb. 24, 1983, Ser. No. 469,337

Int. Cl.[4] H01L *27/04*; G11C *11/40*

U.S. Cl. 357—45 **3 Claims**



2. Article for storing information in binary form, comprising:

a semiconductor having a doped portion containing first and second impurities and p-n junction, said doped portion containing non-annealed lattice defects,

spaced conductive electrodes disposed in a circular concentric pattern so as to contact a surface of said doped portion on one side of said p-n junction,

at least one discrete, localized annealed region in said doped portion representative of one state of said binary form, and

at least one discrete, non-annealed region in said doped portion representative of the other state of said binary form.

4,593,307

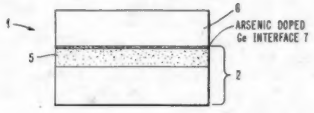
HIGH TEMPERATURE STABLE OHMIC CONTACT TO GALLIUM ARSENIDE

Hans S. Rupprecht, Yorktown Heights, and Sandip Tiwari, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,732

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—67 **6 Claims**



1. A semiconductor device comprising:

a substrate of a Group III–V compound having a given uniform concentration of n-type dopant therein,

a region of said substrate doped with germanium,

a layer of a germanide of refractory metal molybdenum disposed over said substrate, and,

a interface region of germanium heavily doped with Group V element of said Group III–V compound disposed between said region and said layer of germanide, said interface region having a thickness of 100 Angstroms or less, said device having a contact resistance of 10^{-6} ohm cm^2.

4,593,308

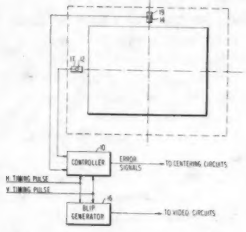
AUTOMATIC CORRECTION OF CENTERING AND CONVERGENCE ERRORS IN CRT DISPLAYS

Steven C. Kemplin, Virginia Beach, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Apr. 27, 1984, Ser. No. 604,567

Int. Cl.[4] H04N *17/02, 17/00*; H01J *29/70*

U.S. Cl. 358—10 **4 Claims**



1. A system for the automatic correction of centering errors in a cathode ray tube display, said display having a major axis and a minor axis perpendicular to one another, said system comprising:

a first masked light sensor positioned on said major axis and a second masked light sensor positioned on said minor axis, said first and second light sensors being located outside the field of view of said display but within the scanned area;

light blip generator means responsive to horizontal and vertical timing pulses supplied to said cathode ray tube display for unblanking the video circuits during the horizontal and vertical blanking intervals to thereby generate light pulses in the vicinities of said first and second light sensors; and

microprocessor feedback controller means responsive to the outputs of said first and second light sensors and connected to centering circuits in said cathode ray tube display for iteratively generating correction signals to the

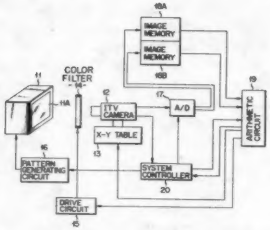
centering circuits whenever no output is received from one or the other or both of said first and second light sensors.

4,593,309

METHOD OF CONVERGENCE MEASUREMENT FOR A COLOR PICTURE TUBE AND AN APPARATUS THEREFOR

Shinichi Uno; Etsuji Suzuki; Ryuhachirou Douji, and Mituji Inoue, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 19, 1983, Ser. No. 543,457
Claims priority, application Japan, Oct. 21, 1982, 57-185112
Int. Cl.[4] H04N *17/02*
U.S. Cl. 358—10 **8 Claims**



1. A method for measuring the convergence of a color picture tube, comprising the steps of:

indicating a prescribed pattern in a reference position on the display screen of a picture tube on which a plurality of light emitting layers emitting light beams of different colors are successively and alternately arranged at regular intervals;

picking up the image of a pattern for each light beam color from a predetermined position, thereby providing first image pickup data,

shifting the display position of the pattern on the display screen from the reference position to a shifted position at a distance half the arrangement pitch of the light emitting layers, in the arrangement direction thereof from the reference position;

picking up an image of the pattern in the shifted position, for each light beam color from the predetermined position, thereby providing second image pickup data; and

calculating the average values of the first and second image pickup data for each light beam color and determining the convergence on the basis of the average values.

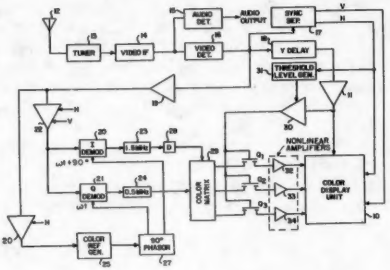
4,593,310

VIDEO CHROMA CONTROLLER GATING CHROMINANCE SIGNALS BY THE LUMINANCE SIGNAL

Jimmie D. Songer, Burleson, Tex., assignor to High Resolution Television, Inc, Los Angeles, Calif.

Filed Sep. 22, 1983, Ser. No. 534,837
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—37 **4 Claims**

1. A method for improving the resolution of color television display in a television system having a broad bandwidth luminance signal and color signals bandwidth limited by filters just prior to display on a device, comprising the steps of detecting when the luminance signal is above a predetermined threshold level, and in response to the threshold detected luminance signal, switching off the color signals applied to said display



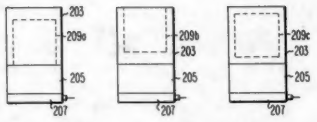
device while said luminance signal is below said threshold level.

4,593,311

ELECTRICAL REGISTRATION OF CCD IMAGERS

Peter A. Levine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1983, Ser. No. 556,582
Int. Cl.[4] H04N *9/093, 9/09, 3/14*
U.S. Cl. 358—51 **7 Claims**



1. In a television camera having a solid-state imager including a photosensitive surface having photosensors arranged in a plurality of lines for developing lines of signals representative of information in a scene imaged thereon and a storage area into which said plurality of lines of signals are transferred and from which is provided a television signal having active field portions representative of said scene, an apparatus comprising:

lens means for imaging said scene onto said photosensitive surface of said imager;

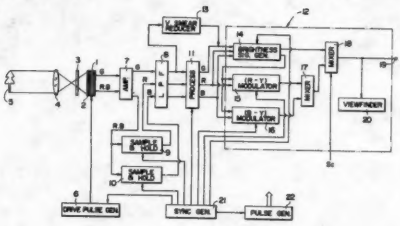
clock means for providing a plurality of clocking transfer signals to said photosensitive surface and said storage area for transferring said lines of signals representative of information in said scene from said photosensitive surface into and then from said storage area; and

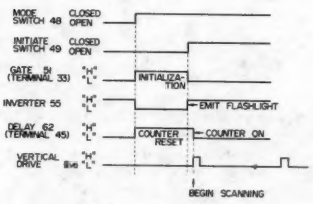
clock control means, responsive to said clock means, for adjustably controlling the number of said clocking transfer signals provided to said photosensitive surface and said storage area so as to control the vertical position of the lines of signals produced from a predetermined portion of said photosensitive surface having an area less than the total area of said photosensitive surface into said storage area such that when said lines of signals are transferred from said storage area they correspond in time with said active field portions of said television signal, thereby producing a television signal representative of the scene imaged onto said predetermined portion.

4,593,312
EMISSION CONTROLLER FOR ELECTRONIC FLASH ASSOCIATED WITH AN ELECTRONIC CAMERA

Masafumi Yamasaki, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed Aug. 31, 1983, Ser. No. 528,163
Claims priority, application Japan, Oct. 27, 1982, 57-188532
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—909 **16 Claims**





1. An emission controller for an electronic flash associated with an electronic camera which includes both a solid pickup element having individual photoelectric transducer elements which define picture elements of the solid state pickup element, and means for normally repeatedly scanning the transducer element in a predetermined timing sequence; said emission controller comprising:

(a) means for disabling the scanning means and initializing the individual photoelectric transducer elements by placing each of said transducer elements at a common charge level, prior to the emission of flash light from said electronic flash;

(b) means for resetting the transducer elements in substantially simultaneous synchronized relationship with the emission of flash light from the electronic flash so as to permit the charge level of each individual transducer element to change as function of the amount of light from the electronic flash impinging on that transducer element; and

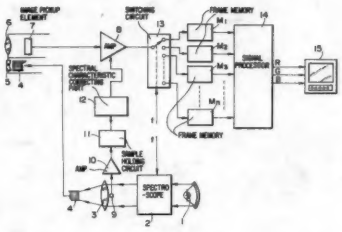
(c) means for enabling the scanning means so as to initiate a sequential scanning of the transducer element at a given time delay after the emission of flash light from the electronic flash.

4,593,313
ENDOSCOPE

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,200
Claims priority, application Japan, Sep. 5, 1983, 58-163586
Int. Cl.⁴ A61B *1/04*
U.S. Cl. 358—98 **6 Claims**

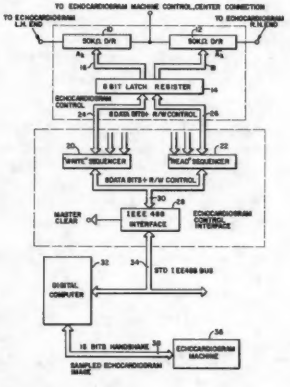
1. Endoscope equipment consisting of an illuminating means to irradiate in time series the light separated into multiple wavelength regions to illuminate a subject, image pickup element to receive the light reflected from the subject and convert it into electrical signals, light receiving element having the same characteristics as the image pickup element to receive the light separated into multiple wavelength regions and convert it into electrical signals, correcting means to control the electrical signals from the aforementioned image pickup element on basis of the electrical signals obtained at the light receiving element and correct the spectral characteristics, signal processing means to process the electrical signals corrected by the correcting means for each wavelength regions and produce the signals for screen display, and display means to display the picture in each wavelength region using the signals from the signal processing means and by means of a particular color signal and display are spectral waveform.



4,593,314
ECHOCARDIOGRAM MACHINE CONTROL

William M. Siler, Birmingham, Ala., assignor to The Kemp-Carraway Heart Institute, Birmingham, Ala.

Filed May 17, 1984, Ser. No. 611,103
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 358—112 **10 Claims**



1. Automatic display adjustment means for an echocardiogram machine having a display device and at least one control for controlling brightness of the display comprising:

means for sensing a selected aspect of relative brightness of pixels within a defined area of the display device controlled by the control and generating an output representative thereof;

computer means for receiving brightness sensing signals, comparing them to a predetermined standard and producing a correction signal;

control means provided at said control and responsive to correction signals to increase or decrease the control effect within the selected area; and

means enabling the correction signal from the computer means to be applied to the control means.

4,593,315

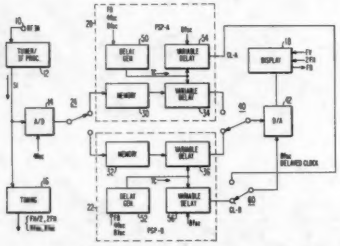
PROGRESSIVE SCAN TELEVISION RECEIVER FOR NON-STANDARD SIGNALS

Donald H. Willis, and Todd J. Christopher, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed May 29, 1984, Ser. No. 615,423

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—140 **1 Claim**



1. In a progressive scan receiver of the type having memory means, a source of memory read and write clock signals coupled to said memory means for storing a video signal in said memory means and for recovering each stored line of said video signal N times for application to display means having a horizontal sweep rate selected for displaying said video signal occurring N times, the improvement comprising:

first means for measuring the phase of said memory read and write clock signals, each with respect to a horizontal synchronizing signal associated with said display means; and

second means for delaying the recovered video signal as a function of the difference between the read and write clock phase measurements each time the memory is read.

4,593,316

IMAGE PROCESSING SYSTEM

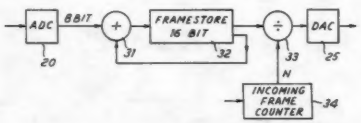
Paul R. N. Kellar, Newbury, and Robert J. Long, Didcot, both of England, assignors to Micro Consultants Limited, Surrey, England

Filed Apr. 9, 1984, Ser. No. 597,981

Claims priority, application United Kingdom, Apr. 15, 1983, 8310239

Int. Cl.[4] H04N *5/217, 7/01*

U.S. Cl. 358—140 **10 Claims**



1. A video signal processing system comprising:

storage means for video signals representing an image;

input means for repeatedly writing video signals in said storage means at input line and frame rates, video signals relating to the same point of successive image frames being superimposed in said storage means;

output means for repeatedly reading video signals from said storage means at output line and frame rates differing from said input rate, said output means being arranged to operate contemporaneously with said input means so that the image can be reproduced in response to the image signals from said output means, whilst writing is taking place; and

means for producing attenuation of said superimposed video signals as a function of the number of frames superimposed by said input means.

4,593,317

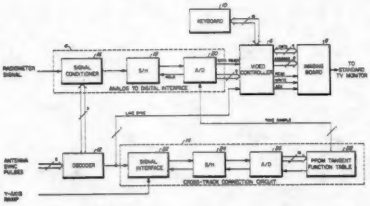
MOVING SCENE DISPLAY FOR PASSIVE RADIATION-WAVE IMAGING SYSTEM

Bruce M. Heydlauff, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 13, 1984, Ser. No. 639,890

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—140 **3 Claims**



1. A moving scene display for passive radiation wave imaging system which comprises:

an analog to digital interface having first, second and third inputs, and having first and second outputs;

a video controller having a first input connected to the second output of the analog to digital interface, having a second input connected to the first output of the analog to digital interface, having third, fourth, and fifth inputs, and having first, second, third, fourth, fifth, and sixth outputs;

a keyboard having an input connected to the first output of the video controller and having an output connected to the third input of the video controller;

an imaging board having a first input connected to the sixth output of the video controller, having a second input connected to the fifth output of the video controller, having a third input connected to the fourth output of the video controller, having a fourth input connected to the third output of the video controller, having a fifth input connected to the second output of the video controller, having a first output connected to the fourth input of the video controller, and having a second output;

a decoder having an input, having a first output connected to the third input of the analog to digital interface, and having a second output connected to the fifth input of the video controller; and

a cross-track correction circuit having a first input connected to the second output of the decoder, having a second input, and having an output connected to the second input of the analog to digital interface.

4,593,318

TECHNIQUE FOR THE TIME COMPRESSION MULTIPLEXING OF THREE TELEVISION SIGNALS

Kai Y. Eng, Cliffwood Beach; Barin G. Haskell, Tinton Falls, and Robert L. Schmidt, Wanamassa, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 3, 1983, Ser. No. 500,954

Int. Cl.[4] H04N *7/08, 7/04*

U.S. Cl. 358—142 **24 Claims**

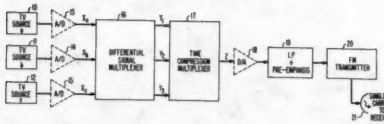
5. A television signal transmitter comprising:

first multiplexing means (16) responsive to three successive picture signals from a standard television signal source for generating one of said three successive picture signals as is as one of three output signals from the first multiplexing

means and for generating a first and a second differential signal between said one of the three successive picture signals generated as is and the other two of the three successive picture signals, respectively, as the remaining two of the three output signals from the first multiplexing means;

second multiplexing means (17) responsive to the three output signals from said first multiplexing means for time compressing said one as is output signal by a first predetermined amount to fit in a first portion of the standard television signal time period and for time compressing each of said first and second differential output signals by a second predetermined amount to fit in a second and a third portion, respectively, of said standard television signal time period not forming a part of said first portion; and

means (18–21) capable of transmitting the time compressed signals from the second multiplexing means during an associated standard television picture signal time period.

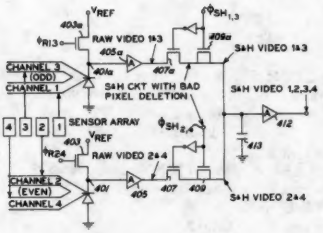


4,593,319

HIGH RESOLUTION QUADRILINEAR CCD IMAGER WITH FOUR CHANNEL TO ONE CHANNEL MULTIPLEXING

Narayan K. Kadedodi, Torrance; Shey-Ping L. Sheu, San Pedro, and Abd-El-Fattah A. Ibrahim, Palos Verdes Estates, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 20, 1983, Ser. No. 486,768
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 358—213 **7 Claims**



1. A high resolution charge coupled device (CCD) imager on a single integrated circuit chip including a quadrilinear array of shift registers for intermediate storage of information detected by an array of photosites, wherein the improvement is characterized by:

first multiplexing circuit means on said integrated circuit chip for multiplexing the video signal outputs of two of said quadrilinear array of shift registers,

second multiplexing circuit means on said integrated circuit chip for multiplexing the video signal outputs of the other two of said quadrilinear array of shift registers, and

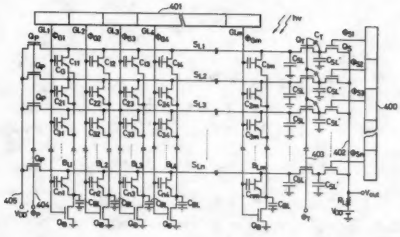
third multiplexing circuit means on said integrated circuit chip for multiplexing the video signal outputs of said first and second multiplexing circuit means, such that the output of said third multiplexing circuit means is a video signal train representative of information detected by said array of photosites.

4,593,320

TWO-DIMENSIONAL SOLID-STATE IMAGE PICKUP DEVICE

Jun-ichi Nishizawa, and Takashige Tamamushi, both of Sendai, Japan, assignors to Jun-Ichi Nishizawa, Sendai, Japan

Filed Mar. 21, 1985, Ser. No. 714,677
Claims priority, application Japan, Mar. 23, 1984, 59-56489
Int. Cl.⁴ H04N *3/12*
U.S. Cl. 358—213 **6 Claims**



1. A two-dimensional solid-state image pickup device comprising a plurality of picture elements each comprising a normally off static induction transistor and a gate capacitor connected to the gate of said static induction transistor, a plurality of vertical address gate lines connected in common to the respective gate capacitors of said picture elements arranged along respective lines, a plurality of signal reading lines connected in common to the drains of the respective static induction transistors forming said picture elements arranged along the respective lines, a plurality of precharging transistors connected to each of said plurality of signal reading lines, a voltage source connected in common to said plurality of signal reading lines through said precharging transistors, a plurality of first capacitors connected between each of said plurality of signal reading lines and the ground, a video output line connected in common to each of said plurality of signal reading lines through a transfer transistor and first switching transistor connected in series and connected to the ground through a load resistance and video voltage source, a transfer pulse address gate line connected in common to the gates of said respective transfer transistors, a second capacitor connected between the gates and drains of said respective transfer transistors, a third capacitor connected between the drain of said respective transfer transistors and the ground, a plurality of source lines connected in common to the sources of the respective static induction transistors forming said picture elements connected respectively to said respective vertical address gate lines a plurality of second switching transistors connected respectively between said respective source lines and the ground and having the respective gates connected to said respective vertical address gate lines a plurality of fourth capacitors in case said respective second switching transistor is in the off-state connected respectively between said respective source lines and the ground and a plurality of second capacitors connected respectively between said respective source lines and the ground, in order to arrange said plurality of picture elements in the form of a matrix, said plurality of vertical gate address lines and said plurality of source lines being arranged in parallel with each other and said plurality of signal reading lines being arranged so as to intersect rectangularly with said plurality of vertical address gate lines and said plurality of signal reading lines and, in order to make an X-Y address, vertical shift pulses, which are generated from a vertical shift

resistor being impressed onto said respective vertical address gate lines and horizontal shift pulses, which are generated from a horizontal shift register being impressed onto the gates of said respective first switching transistors and, when the capacitance of said gate capacitor is represented by C_G, the capacitance of said first capacitor is represented by C_{SL}, the capacitance of said second capacitor is represented by C_T, the capacitance of said third capacitor is represented by C_{SL}' and the capacitance of said fourth capacitor is represented by C_{BL}, the relation of $C_G < C_{SL}' \approx C_T \approx C_{SL} \approx C_{BL}$ being satisfied.

4,593,321

METHOD OF ADJUSTING THE CURRENT INTENSITY OF AN ELECTRON BEAM IN A PICKUP TUBE AND TELEVISION CAMERA SYSTEM SUITABLE THEREFOR

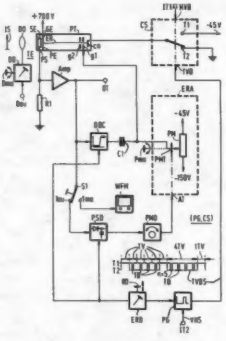
Hendrik Blom; Filippus L. Stok, and Engbert Tienkamp, all of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1983, Ser. No. 536,420

Claims priority, application Netherlands, Oct. 19, 1982, 8204022

Int. Cl.[4] H04N *5/235*

U.S. Cl. 358—219 8 Claims



1. A method of adjusting the beam current of the scanning electron beam in a television pickup tube having a target, said tube producing a picture signal, said method comprising the steps of:

repeatedly scanning the electron beam across the target at a fixed scanning rate, each complete scan of the target being a scan cycle;

suppressing the electron beam current as the electron beam is scanned across a selected area of the target over a selected number of one or more consecutive scan cycles in order to integrate charge generation at the selected area of the target;

reading out the charge integrated at the selected area of the target by scanning the selected area of the target over one scan cycle with the beam current at its nonsuppressed setting;

repeating the steps of suppressing and reading out; and

adjusting the nonsuppressed beam current setting to the lowest nonsuppressed beam current which produces the maximum picture signal from the selected area of the target.

4,593,322

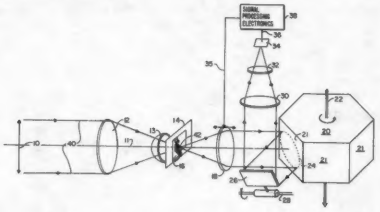
AUTOFOCUS SYSTEM FOR INFRARED IMAGING DEVICE

Irving R. Abel, Lexington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 14, 1985, Ser. No. 690,909

Int. Cl.[4] H01J *31/49*

U.S. Cl. 358—227 10 Claims



1. Apparatus for determining the position of best focus of a system for imaging radiation from a scene of interest, said apparatus comprising

A. a focal plane;

B. means for receiving a beam of energy from said scene of interest;

C. a transmissive plate positioned at said focal plane, said plate comprising a plurality of regions having different thicknesses, each said thickness providing a different optical path length, and wherein said plate is positioned in the path of a portion of said beam in order to create a focal bias substantially equal to each said optical path length of each said region;

D. at least one detector element coupled to receive said beam in order to create an electrical signal whose intensity relates to the brightness of said scene of interest;

E. means for scanning said beam across said scene of interest in order to create a raster type scan pattern in which points on said scene of interest are imaged on said at least one detector element; and wherein

F. that portion of said beam passing through said transmissive plate onto said at least one detector element by means of said means for scanning provides different frequency content of said signal, wherein the highest said frequency content corresponds to the position of best focus of said system.

4,593,323

FACSIMILE SYSTEM CONTROL APPARATUS

Hajime Kanda, Ayase; Katsuo Murase, Tokyo; Hiroshi Hishida, Sagamihara; Eiichi Adachi, Atsugi; Yoshinori Wada, Miura, and Yuji Koseki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Apr. 8, 1982, Ser. No. 366,579

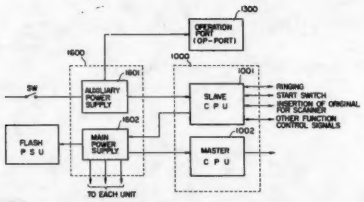
Claims priority, application Japan, Apr. 9, 1981, 56-53553; Apr. 20, 1981, 56-59566

Int. Cl.[4] H04N *1/00*

U.S. Cl. 358—256 10 Claims

1. An apparatus for controlling a facsimile system comprising a main power supply, an auxiliary power supply, switch means for controlling the on/off condition of said auxiliary power supply, a first central processing unit (CPU) to which power is supplied from said main power supply which is turned on only during the operation of transmitting or receiving image signals and a second central processing unit (CPU) to which is normally supplied power from said auxiliary power supply when turned on by said switch means, whereby said second CPU monitors in a monitoring mode the condition of the facsimile system while it is in a stand-by state and in response to a command signal for the initiation of transmission or reception of image sigsnals or a telephone calling signal, said

second CPU causes said main power supply to be turned on thereby causing said first CPU to be operatively connected to said main power supply and making said second CPU functionally dependent upon said first CPU whereas, upon completion of the transmitting or receiving operation, said second CPU causes said main power supply to be turned off thereby causing



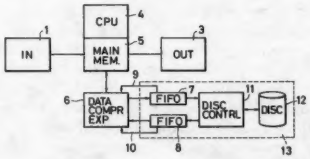
said first CPU to be operatively disconnected from said main power supply in response to an instruction signal supplied from said first CPU, thereby reestablishing the monitoring mode, and, wherein said first CPU supplies an inquiry command signal to said second CPU upon being connected to said main power supply, said inquiry command signal inquiring as to the causes of the connection to said main power supply.

4,593,324

IMAGE DATA STORING DEVICE

Tetsuo Ohkubo, and Hiroyuki Kataoka, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 368,236, Apr. 13, 1982, abandoned.
This application Sep. 26, 1985, Ser. No. 780,241
Claims priority, application Japan, Apr. 14, 1981, 56-55110
Int. Cl.[4] H04M *1/00*; G06F *9/00*
U.S. Cl. 358—261 **3 Claims**



1. An image data storage system comprising a central processing unit connected to a main memory and connected to input/output devices, including:

an auxiliary data storage system having a magnetic storage disc, read/write control means for said magnetic storage disc and a disc controller;

a data compression/expansion device provided between said main memory and said auxiliary memory device, which compresses data by means of a one dimension run length coding technique with the compression rate of said compression/expansion device being selected according to the ratio between the data transfer rate from said memory to said compression/expansion device and the data transfer rate from said compression/expansion device to the storage media of said magnetic storage disc;

said auxiliary memory device comprising a pair of FIFO memories for transfer of data in either direction between said magnetic storage disc and said compression/expansion device;

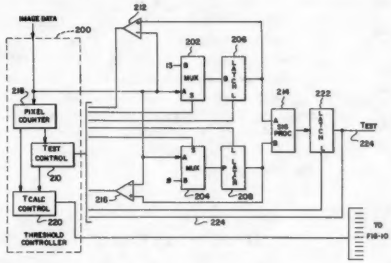
wherein image data are transmitted between said main memory and said data compression/expansion device at the same time that compressed data which are obtained by compressing said image data are transmitted between said data compression/expansion device and said auxiliary memory device.

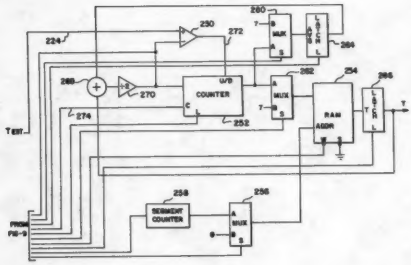
4,593,325

ADAPTIVE THRESHOLD DOCUMENT DUPLICATION

Henry N. Kannapell, Raleigh, N.C., and Thomas W. Bobick, Richardson, Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 20, 1984, Ser. No. 642,016
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—282 **12 Claims**





1. A method for duplicating a document wherein grayscale image data are compared to a threshold to convert said grayscale image data to binary image data suitable for use in a bilevel printing device, said method comprising the steps of:

scanning a document to generate grayscale image data representative of individual pixels of said document;

dividing said grayscale image data into image data groups each corresponding to a plurality of said pixels;

calculating estimated thresholds for each of said image data groups based on the grayscale values of the pixels within said groups;

calculating average thresholds for the areas of said image data groups by averaging the thresholds for groups contiguous to said groups for which thresholds have been previously established;

setting adaptive thresholds for said image data groups within a defined band surrounding said average thresholds by comparing said estimated thresholds to said average thresholds;

comparing said grayscale image data to said adaptive thresholds to generate binary image data; and

printing a duplicate of said document based on said binary image data.

4,593,326
ELECTROMECHANICAL PREPARATION OF PHOTOENGRAVING CYLINDERS

Jean Chevalier, 93 Avenue des Champs Elysees, Paris 75008, France

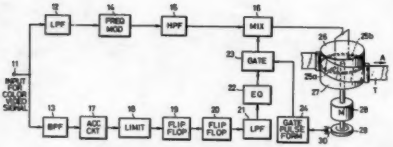
Filed Sep. 25, 1984, Ser. No. 654,386
Claims priority, application France, Sep. 26, 1983, 83 15214
Int. Cl.[4] H04N *1/21, 1/23;* **G03B** *27/62*
U.S. Cl. 358—299 **9 Claims**

1. A process for making a gravure printing plate comprising:
(1) providing a halftone transparency,
(2) putting a reflective layer in adhered optical contact with one side of said transparency,
(3) placing said transparency with the reflective layer on a scanning drum of an electro-mechanical gravure etcher,
(4) scanning the transparency with radiation,
(5) generating electronic signals from radiation which is reflected from the transparency during scanning, and
(6) using the electronic signals to direct a mechanical etcher to etch the gravure plates.

4,593,327
COLOR VIDEO SIGNAL RECORDING AND/OR REPRODUCING SYSTEM

Akira Hirota, Chigasaki, and Yoshimichi Nagaoka, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 21, 1983, Ser. No. 534,372
Claims priority, application Japan, Sep. 25, 1982, 57-166799
Int. Cl.[4] H04N *9/491, 5/78*
U.S. Cl. 358—330 **8 Claims**

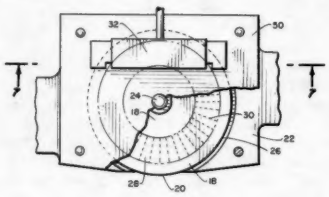


1. A color video signal recording system comprising:
recording means for recording a recording signal on each track on a recording medium;
separating means for separating an input color video signal into a luminance signal and a carrier chrominance signal;
frequency modulating means for frequency modulating a carrier by the luminance signal which is separated in said separating means, and for producing a frequency modulated luminance signal;
frequency converting means for frequency converting the carrier chrominance signal which is separated in said separating means, into a band which is lower than a band occupied by said frequency modulated luminance signal;
gating means for passing an output frequency converted carrier chrominance signal of said frequency converting means with an interval of one track scanning period in which said recording means scans over one track on said recording medium; and
mixing means for mixing the frequency modulated luminance signal from said frequency modulating means and the frequency converted carrier chrominance signal which is intermittently obtained from said gating means with the interval of one track scanning period,
said mixing means alternately producing a mixed multiplexed signal in which the frequency modulated luminance signal and the frequency converted carrier chrominance signal are multiplexed, and a signal solely comprising the frequency modulated luminance signal, for every one track scanning period,
said output signal of said mixing means being supplied to said recording means as said recording signal.

4,593,328
TIMING WHEEL FOR CARD ENCODER

René Baus, Jr., Palos Verdes, Calif., assignor to American Magnetics Corporation, Torrance, Calif.

Filed Dec. 8, 1980, Ser. No. 214,166
Int. Cl.[4] G11B *25/04;* **G06K** *13/00*
U.S. Cl. 360—2 **2 Claims**



1. In apparatus for imposing accurately encoded data on a record member:
a base having track means along which the member may be moved;
a wheel rotatably mounted with respect to said base with its circumferential periphery tangentially intercepting said track means and in position to be frictionally engaged by the member and rotated thereby as the member is moved along said track means;
an annular strip of permanently magnetizable material on said wheel located radially inward of said periphery;
said strip being magnetized around the annulus with discrete changes in magnetic strength and/or polarity, to provide pulse generating means for inducing in a magneto/electric pick-up means a succession of discrete electric pulses;
magneto-electric pick-up means located adjacent said strip for transducing changing magnetic field produced by rotation of said wheel into electric pulses;
writing means positioned adjacent said track means for recording data on the member;
circuit means connected between said pick-up means and said writing means for transducing said electric pulses into control signals for data applicable to the member through said writing means.

4,593,329
MAGNETIC DATA STORAGE APPARATUS HAVING A MAGNETIC DISK NORMALLY IN CONTACT WITH A TRANSDUCER HEAD, AND METHOD OF OPERATION

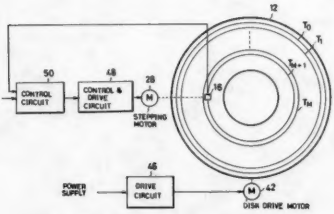
Yuji Hayakawa, Nagoya, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Jan. 11, 1985, Ser. No. 690,539
Claims priority, application Japan, Jan. 23, 1984, 59-10796
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—75 **5 Claims**

3. A method of operation for a magnetic data storage apparatus wherein a magnetic transducer head is held in contact with a magnetic disk when the latter is out of rotation, the magnetic disk having data storage tracks and a head landing track formed at least on one face thereof, which method comprises:
(a) setting the magnetic disk into rotation at more than a predetermined speed to cause the transducer head to pneumatically move out of contact with the magnetic disk, the transducer head effecting data transfer with the magnetic disk by accessing the data storage tracks thereon

while being thus held out of contact with the revolving magnetic disk;

(b) moving, upon completion of the data transfer between the transducer head and the magnetic disk, the transducer head to a position over the head landing track on the



magnetic disk while the latter is in rotation at more than the predetermined speed; and

(c) terminating the rotation of the magnetic disk after the transducer head has moved to the position over the head landing track on the magnetic disk, in order to cause the transducer head to land on the head landing track.

4,593,330

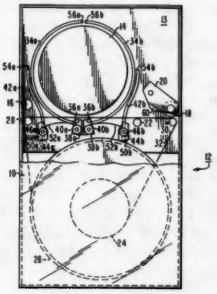
TAPE THREADING ARRANGEMENT FOR 360 DEGREE WRAP TAPE RECORDER

Henry R. Warren, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 26, 1983, Ser. No. 488,814

Int. Cl.[4] G11B *15/00, 15/66*

U.S. Cl. 360—85 **7 Claims**



1. Apparatus for threading, in a compact arrrangement, a tape around a drum, comprising a deck having the drum mounted thereon and a first and a second pair of slots formed therein, each of said first pair of slots angularly extending about said drum in a first arcuate path that generally follows the circumference of said drum to provide, as a pair, a wrap angle of nearly 360 degrees, each of said second pair of slots angularly extending about said drum to a smaller angular extent than each of said first pair of slots, in a second arcuate path that generally follows said first arcuate path, a first pair of movable guide means respectively disposed in said first pair of slots for wrapping said tape about the drum along said wrap angle, and mean including a second pair of movable guide means respectively disposed in said second pair of slots and actuated by and a variable distance from said first pair of guide means for positioning said tape during threading operation to avoid contact with the portion of the tape wrapped on said drum, said first pair of slots being interposed between said drum and said second pair of slots to maintain a compact threading path for said tape.

4,593,331

TAPE PLAYER

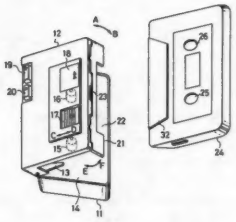
Seiji Tomita, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1983, Ser. No. 537,438

Claims priority, application Japan, Oct. 1, 1982, 57-170920; Oct. 1, 1982, 57-170921; Oct. 1, 1982, 57-170922; Oct. 1, 1982, 57-147967[U]; Oct. 1, 1982, 57-147968[U]; Oct. 1, 1982, 57-147969[U]

Int. Cl.[4] G11B *17/00, 25/06*

U.S. Cl. 360—93 **19 Claims**



1. A tape cassette transport comprising:

a housing;

means, disposed in said housing, for moving tape in said cassette;

a cover pivotably attached along a first edge of said housing, said housing and said cover defining a cassette receiving space therebetween, said tape cassette extending beyond three exterior edges of said housing and said cover when inserted in said cassette receiving space;

a door pivotably attached to a second edge of said cover opposite said first edge; and

means for biasing said door to extend from said cover across said cassette receiving space to said housing, said door being pivoted from across said cassette receiving space when a tape cassette is inserted in said cassette receiving space.

8. Apparatus for transporting tape in a cassette having a thickened portion, said apparatus comprising:

a housing defining a cassette receiving space, said cassette extending beyond three exterior edges of said housing and said cover when inserted in said cassette receiving space;

a cassette holder disposed in said cassette receiving space;

spring means, disposed in said cassette receiving space and coupled to said housing, for engaging an edge of said thickened portion when said tape cassetted is in said cassette holder to prevent said tape cassette from withdrawing from said cassette holder; and

means, disposed in said housing, for moving said tape.

13. Apparatus for transporting tape in a cassette having at least one reel, said apparatus comprising:

a housing;

at least one spindle attached to said housing and having at least a rotatable portion for driving with said at least one reel;

a cover pivoatably attached to said housing, said housing and said cover defining a cassette receiving space therebetween;

means for locking the position of said cover with respect to said housing, said locking means including a latch disposed on said spindle and engaging means, disposed on said cover, for selectively engaging said latch; and

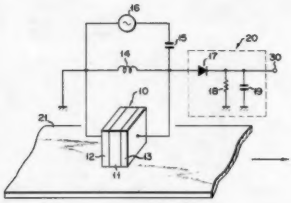
means for driving said rotatable portion of said spindle.

4,593,332

MAGNETIC REPRODUCTION SYSTEM UTILIZING MAGNETIC BODY AS CAPACITOR

Junichi Akiyama; Shu Chiba, and Norikazu Sawazaki, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 14, 1983, Ser. No. 485,060
Claims priority, application Japan, Apr. 21, 1982, 57-65448
Int. Cl.[4] G11B 5/34, 5/04
U.S. Cl. 360—111 11 Claims



1. A magnetic reproducer comprising:

tuned circuit means having a capacitance element and an inductance element connected to said capacitance element in parallel, said capacitance element including a pair of electrodes and a magnetic body between said electrodes and serving as a magnetic head, the magnetic permeability of said magnetic body changing due to a change in the magnetic field formed by a magnetic recording medium;

means for supplying a high-frequency input signal to said tuned circuit means; and

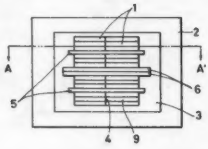
detecting circuit means for detecting a change in a high-frequency output signal from said tuned circuit means so as to reproduce signals recorded on said magnetic recording medium, the change in the high-frequency output signal being dependent on a change in said magnetic permeability of said magnetic body which is caused by the change in the magnetic field of said magnetic recording medium.

4,593,333

MAGNETIC HEAD

Michio Yanagi, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,715
Claims priority, application Japan, Jan. 18, 1982, 57-5797
Int. Cl.[4] G11B 7/12
U.S. Cl. 360—125 10 Claims



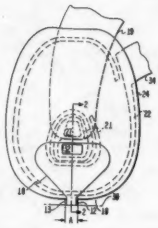
1. A magnetic head which comprises a magnetic head element constituted of a core composed of a material of high permeability, a case for the magnetic head element, the magnetic head element being fixed into said case with a fixing material which comprises a tetrafunctional epoxy resin and a bifunctional epoxy resin, the amount of tetrafunctional epoxy resin being 10–80% by weight based on the total amount of the bifunctional epoxy resin and the tetrafunctional epoxy resin.

4,593,334

THIN FILM TRANSDUCER

Nathaniel C. Anderson, Pine Island; Larry E. Daby, Rochester; Gene A. Johnson, Rochester, and Patrick M. McCaffrey, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1983, Ser. No. 490,631
Int. Cl.[4] G11B 5/12
U.S. Cl. 360—126 2 Claims



1. A thin film transducer for recording and reading magnetic transitions on a magnetic recording medium, said transducer comprising:

two layers of magnetic material deposited on a substrate and forming a yoke structure comprising a pole tip region and a back gap region;

non-magnetic material deposited between said two layers except at a back gap region, said non-magnetic material forming a transducer gap at the pole tip region;

a flat conductor coil including a plurality of deposited substantially helical turns, at least respective one portions of which are disposed between the two layers of the yoke structure, with a helical coil terminal end within the helical turns;

a conductor member substantially coplanar with the first deposited of said yoke layers and in electrical contact with said helical coil terminal end within the helical turns, extending to a location beyond the periphery of said flat conductor coil and disposed between respective second portions of said flat conductor coil helical turns and said substrate; and

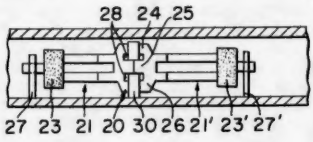
insulating material electrically insulating said conductor coil from said yoke structure and said flat conductor coil helical turns from said conductor member; wherein said first deposited of said layers and said conductor member are formed simultaneously of a common material.

4,593,335

PRESSURE PAD DEVICE FOR A MAGNETIC TAPE CASSETTE

Takateru Sato, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,347
Claims priority, application Japan, Aug. 2, 1982, 57-116250[U]
Int. Cl.[4] G11B 23/02
U.S. Cl. 360—130.33 6 Claims



1. A pressure pad device for a magnetic tape cassette com-

prising a leaf spring having a central fulcrum portion, left and right side portions extending symmetrically from the central fulcrum portion, and a pair of pads, one of said pads being attached on each of the left and right side portions so as to be equidistant from the central fulcrum portion, wherein a fitting hole is formed at the central fulcrum portion by bending alternately a plurality of strip zones formed in the central fulcrum portion of said leaf spring in opposed directions so as to matingly engage a central supporting pole in the magnetic tape cassette, said fitting hole being adapted to receive said supporting pole of said magnetic tape cassette; and wherein each end of said left and right side portions of said leaf spring is flexibly in contact with a supporting pin of said magnetic tape cassette.

4,593,336

MAGNETIC RECORDING

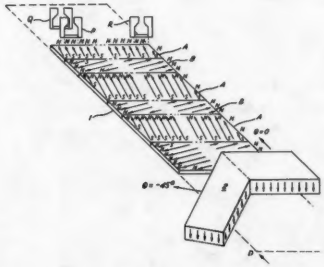
David J. Sansom, Chertsey, England, assignor to Emi Limited, Hayes, England

Filed May 17, 1983, Ser. No. 495,527

Claims priority, application United Kingdom, May 18, 1982, 8214500

Int. Cl.[4] G11B *23/00*

U.S. Cl. 360—131 **9 Claims**



1. A method of reading information which is permanently recorded on a magnetic layer containing magnetically anisotropic particles, selected first regions of said layer containing particles whose easy axes are predominantly oriented in a selected first orientation direction, said first regions being spaced from one another regions containing particles whose easy axes are predominantly orientated in a selected second orientation direction, said permanently recorded information being represented by the positions of transitions which define the boundaries between adjacent first and second regions, said transitions lying substantially parallel to one another, said information being prepared for read-out by the application and subsequent removal of a saturating uni-directional developing field, neither of said first and second orientation directions being parallel to said transitions, and said developing field being in a direction lying between said first and second orientation directions and not at right angles to the transitions such that the components of remanant magnetisation at right angles to the transitions in adjacent first and second regions are in opposite directions, field sensing means being used to detect the positions of said transitions.

4,593,337

VIDEO CASSETTE PLAY COUNTING, STORING AND READING SYSTEM

Alfredo Leone, 785 Park Ave., New York, N.Y. 10021, and Joel B. Snyder, Plainview, N.Y., assignors to Alfredo Leone, Brooklyn, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,841

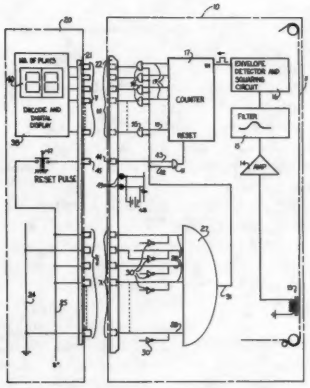
Int. Cl.[4] G11B *5/027, 23/02, 15/48*

U.S. Cl. 360—137 **42 Claims**

1. A prerecorded video tape cassette and program play counting combination insertable in and removable from a cassette player, wherein a single play count is representative of a complete play-back of an entire video program, the combination including a tape prerecorded with a video program, means in the cassette for electrically counting plays of the program, means in the cassette for electrically storing a play count counted by the means for counting, and means for protecting the counting and storing means from unauthorized access.

27. A videotape cassette internal play counting circuit combination including pickup means in the cassette for producing at least one electrical signal representing a single complete play-back of an entire video program on the tape, and electrical counter means in the cassette connected to provide a digital electrical output indication of a counted number of program play-backs in response to signals produced by the pickup means and including means for storing the digital electrical output indication.

35. A video cassette play count decoding arrangement for use with a cassette having a memory, a counter and coded electrical locking means, other than memory addressing provisions for the memory, for selectively preventing and permitting access, in the absence and presence of a preselected coded signal, respectively, to a play count stored in the memory in the cassette representing a number of tape plays, wherein a



single play-count is representative of a complete play-back of an entire video program, the decoding arrangement including terminal means externally accessible of the decoding arrangement and adapted to electrically connect to terminals on a cassette, means for applying an access code to the terminal means corresponding to a code of the coded electrical locking means of the cassette and appropriate to enable access to the play count stored in memory, and display means connected to the terminal means for displaying a play count applied to the terminal means from a cassette.

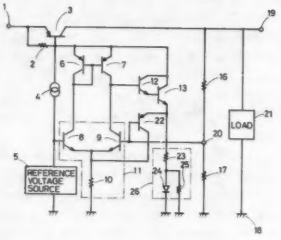
39. A video tape cassette and play counting circuit combination including a cassette housing, means defining a path of tape movement along which a tape moves during playing thereof, wherein a single play count is representative of a complete play-back of an entire video program, detection means located in the housing proximate the path of tape movement and responsive to a play count indication of predetermined characteristics on the tape, means in the housing electrically connected to the detection means for producing an electrical play count signal in response to detection of the play count indication on the tape by the detection means and including signal processing means for shaping the count signal, and counting means in the housing connected for generating a count based on the count signal.

4,593,338

CONSTANT-VOLTAGE POWER SUPPLY CIRCUIT

Koji Takeda; Takeshi Sugimoto, and Yusuke Yamada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1984, Ser. No. 608,577
Claims priority, application Japan, Jun. 15, 1983, 58-108636
Int. Cl.[4] H02H 7/00
U.S. Cl. 361—18 11 Claims



1. A constant-voltage power supply circuit including an improved current limiting protective circuit, said constant-voltage power supply circuit comprising:

a power supply terminal connected to a power source;

a load terminal connected to a load;

a control transistor connected between said power supply terminal and said load terminal for feeding said load with a controlled load current;

a voltage stabilization means for changing the base bias of said control transistor in response to a voltage applied to said load, thereby stabilizing said voltage applied to said load; and

a current control means for detecting the time when said load current flowing to said control transistor exceeds a predetermined current value and changing said base bias of said control transistor, thereby controlling said load current not to exceed said predetermined current value, said current control means being adapted to detect the time when the potential of said load terminal is lowered to a predetermined potential value and change said base bias of said control transistor, thereby to decrease said load current to a current value under said predetermined current value.

4,593,339

ANTI-STATIC TRANSIT CASE

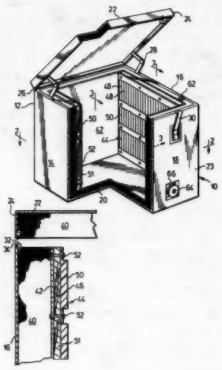
Will B. Robinson, 38 Bernard Avenue, Toronto, Ontario, Canada (M5R 1R2)

Filed Apr. 15, 1985, Ser. No. 723,561
Claims priority, application Canada, May 7, 1984, 453722
Int. Cl.[4] H05F 3/02; B65D 73/02
U.S. Cl. 361—215 17 Claims

1. A container for the transportation of electrostatic sensitive circuit boards or the like comprising:

an outer shell of electrically conductive material;

a conductive support for at least partially surrounding circuit boards when located within said container, and spaced apart from said outer shell by insulating means so as to electrically isolate said conductive support from said outer shell, and



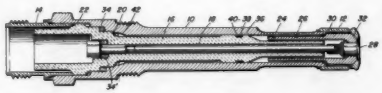
switch means for selectively electrically connecting and disconnecting said outer shell to and from said conductive support.

4,593,340

IGNITER WITH IMPROVED INSULATOR SUPPORT

Helmut P. Meyer, Jacksonville, Fla., assignor to Allied Corporation, Morristown, N.J.

Filed Aug. 13, 1985, Ser. No. 765,299
Int. Cl.[4] F23Q 3/00
U.S. Cl. 361—253 8 Claims



1. In an igniter having a tubular metal shell, a ceramic insulator inserted longitudinally into said shell and enclosed thereby and a center electrode extending axially through said insulator, said insulator being secured to said shell adjacent one end of said insulator; improved means for supporting said insulator within said shell comprising,

a metal collar substantially encircling said insulator adjacent the end thereof opposite the end of said insulator secured to said shell, said collar having an oblate cross sectional form with one surface thereof closely contacting the outer surface of said insulator and with another surface thereof closely contacting the inner surface of said shell,

said collar being substantially in the form of a ring initially having an outer diameter greater than the inner diameter of said shell at the location within said shell of said collar when said insulator is inserted fully into said shell, said ring being extruded into said collar of oblate cross-sectional form in the course of inserting said insulator within said shell.

4,593,341

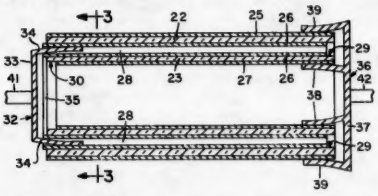
TUBULAR CAPACITOR END TERMINATIONS

Andrew Herczog, Melbourne Beach, Fla., assignor to Corning Glass Works, Corning, N.Y.

Filed May 22, 1985, Ser. No. 736,814
Int. Cl.[4] H01G 1/14, 4/28
U.S. Cl. 361—310 11 Claims

1. A tubular capacitor comprising an outer dielectric cylinder having first and second ends, a plurality of radial dielectric

walls extending inwardly from said outer cylinder, the spaces between said outer cylinder and said radial walls forming longitudinal passages, conductive electrodes on at least the walls that form said passages, and first and second end termination means respectively situated at said first and second ends of said cylinder, said first termination means comprising a base



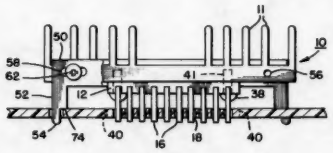
member from which there protrudes a first plurality of longitudinally-extending prongs, said first plurality of prongs extending into at least a portion of said passages and electrically contacting the electrodes therein, said second termination means contacting those of said electrodes that are not contacted by said first termination means.

4,593,342

HEAT SINK ASSEMBLY FOR PROTECTING PINS OF ELECTRONIC DEVICES

Paul H. Lindsay, Vernon, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Nov. 15, 1984, Ser. No. 671,619
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **7 Claims**



1. A heat sink assembly including an electronic device having pins connected to a circuit board, said electronic device having a generally planar configuration with one side parallel to and adjacent said circuit board and one side parallel to and remote from said circuit board, said heat sink assembly comprising:

a relatively massive heat sink having a heat exchange surface thereon contacting in intimate heat exchange relationship the side of the electronic device remote from the circuit board,

heat sink support means secured to the circuit board independently of said electronic device,

first securing means releasably securing the electronic device to said heat exchange surface, and

second securing means releasably securing said heat sink support means to said heat sink, said support means supporting said heat sink from the circuit board in a substantially rigid manner,

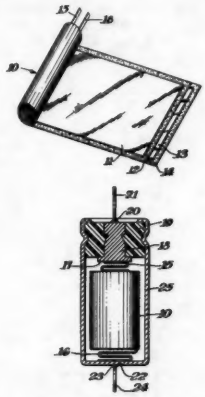
whereby said heat sink is substantially borne by said suport means such that the pins of the electronic device and the connections thereof to the circuit board are substantially isolated from forces resulting from the mass of said heat sink.

4,593,343

ELECTROLYTIC CAPACITOR AND SPACER THEREFOR

Sidney D. Ross, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 5, 1984, Ser. No. 668,053
Int. Cl.[4] H01G *9/00, 4/22, 4/16*
U.S. Cl. 361—433 **4 Claims**



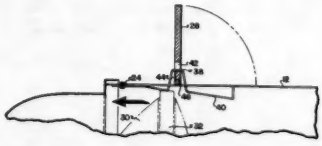
1. An aluminum electrolytic capacitor comprising a rolled foil section having an electrode foil anode bearing a barrier layer dielectric oxide on its surface, an electrode foil cathode, said anode and said cathode being contiguously wound with interleaved spacer material, said spacer material being a cellulosic material which is pulp loaded with 1 to 6 wt % synthetic hydrotalcite and being in contact with an electrolytic capacitor electrolyte.

4,593,344

LIGHT FIXTURE WITH RETAINER

Joseph L. Basile, 7258 Hudson Park Dr., Hudson, Ohio 44236

Filed Dec. 24, 1984, Ser. No. 685,476
Int. Cl.[4] H01R *33/00*
U.S. Cl. 362—226 **9 Claims**



1. A light fixture for maintaining a lamp therein, comprising:

a body member for receiving and housing the lamp, said body member having a plurality of openings about the periphery thereof;

a plurality of securing means affixed to said body member, one associated with each said opening, for making securing engagement with the lamp, each said securing means comprising an elongated member having first and second ends, each such end engaging an inner surface of said body member on opposite sides of an associated one of said openings, said first end being affixed to said body member and said second end being movable upon said body member, said elongated member including a retainer portion extending through said associated opening; and

a cam bar associated with one said elongated member, said

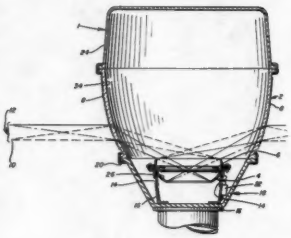
cam bar being interposed between an outer surface of said body member and said retainer portion.

4,593,345

PANORAMIC OPTICAL SYSTEM WITH VERY SHARP BEAM CONTROL

William C. Beggs, 4110 Shawnee La., NE., Atlanta, Ga. 30319

Division of Ser. No. 405,723, Aug. 6, 1982, Pat. No. 4,486,691, which is a division of Ser. No. 165,131, Jul. 2, 1980, abandoned.
This application Nov. 7, 1984, Ser. No. 651,742
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—267 26 Claims



1. A flash lamp for signalling aircraft approaching a runway comprising:

a refractor for receiving a discontinuous source of light and distributing said source in a plurality of directions, said refractor including a plurality of lenses having a common focal plane,

said discontinuous source emitting said light, and

a reflector disposed in the depth of field of said common focal plane reflecting a portion of said light back toward said refractor,

said reflector being focused by said refractor to form an image of said reflector in a far field of the refractor,

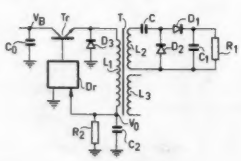
thereby forming a controlled beam of light having at lest one sharply defined edge.

4,593,346

POWER SUPPLY CIRCUIT HAVING TWO MUTUALLY INDEPENDENT OUTPUTS

Fransiscus M. J. Nooijen, and Christianus H. J. Bergmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,071
Claims priority, application Netherlands, Apr. 11, 1983, 8301263
Int. Cl.[4] H02M *3/335;* H04N *3/18*
U.S. Cl. 363—21 5 Claims



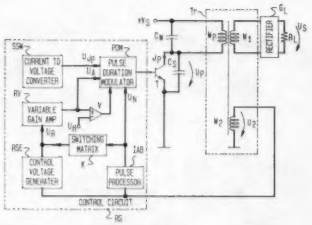
1. A power supply circuit for converting an input d.c. voltage into a first output d.c. voltage which is applied to a first load and into a second output d.c. voltage which is applied to a second load, said power supply circuit comprising the series arrangement of an inductor and a controllable switch, which series arrangement is connected to a terminal for the input voltage, said switch being, in operation, alternatively in the conductive and in the non-conductive states, the first output voltage being derived from a square-wave voltage present across the inductor, the conduction periods of the switch being controlled by means of a control circuit connected to a control electrode of the switch for obtaining for the first output voltage, a value which is substantially independent of variations of the input voltage and of the first load, the power supply circuit further comprising a tuned rectifier coupled to the inductor for producing the second output voltage across a smoothing capacitor, said rectifier being such that a half cycle of sinusoidal circuit flowing therethrough during a period commencing when the switch commences to be conductive, does not exceed the conduction time of the switch, characterized in that the tuned rectifier comprises a series resonant network and a peak-peak rectifier connected thereto, a half cycle of the sinusoidal current flowing through the series resonant network not exceeding the time interval between two consecutive edges of the square-wave voltage present across the inductor whereby variations in the value of one of said loads has substantially no effect on the voltage across the other of said loads.

4,593,347

BLOCKING OSCILLATOR SWITCHED MODE POWER SUPPLY

Günther Peruth, and Michael Lenz, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,256
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1983, 3312209
Int. Cl.[4] H02P *13/22;* H02M *3/335*
U.S. Cl. 363—21 17 Claims



1. In a blocking oscillator switched mode power supply for supplying power to electrical equipment, wherein the primary winding of a transformer is connected in series with a current-carrying section of a three electrode electronic switch, the primary winding being connected to a d-c voltage obtained by rectification of an a-c voltage supplied via two supply terminals, and a secondary winding of the transformer is provided as a current supply to the electrical equipment, wherein furthermore a control electrode of the three-electrode electronic switch is controlled by the output of a control circuit, the control circuit comprising a pulse duration modulator actuated by, firstly, a rectified power a-c voltage output as a control voltage or an actual value and, secondly by a set point adjuster, wherein further a starter circuit is provided for a third control of the pulse duration modulator, and wherein the control circuit is constructed so that its alternating current voltage supply is provided by means of a secondary winding of the transformer, the control circuit further comprising a first circuit part serving for the actuatal or control voltage generation, having included therein a variable gain amplifier and a second circuit part, or the starter circuit, for pulse processing and providing a start signal, the output of the variable gain amplifier as well as the output of the second circuit part for pulse processing being each connected to an input of the pulse duration modulator for actuating the control electrode of the electronic switch, the output of the pulse duration modulator being

the output of the control circuit, while a third control input of the pulse duration modulator is actuated by a current-voltage converter of the control circuit serving as the set point adjuster, characterized by an improvement to the control circuit, the improvement comprising a switching circuit and an operational amplifier, the output of the operational amplifier serving as a fourth control input to actuate the pulse duration modulator (PDM), the output of the circuit part (IAB) for pulse processing and the control voltage generator output for actuation of the variable gain amplifier (RV) being connected together via said switching circuit (K;C2), and the output of the variable gain amplifier (RV) comprising in addition to being connected to the input of the pulse duration modulator (PDM) associated with it, being connected to the non-inverting input of said operational amplifier (V), the inverting input of which is actuated by a fixed auxiliary potential (U_H), and the output of which is connected to an additional control input of the pulse duration modulator (PDM), the design of this additional control input to the pulse duration modulator (PDM) being such that a response threshold voltage level is established by the value of the auxiliary potential (U_H) for response of the pulse duration modulator (PDM) to the signal (U_A) supplied to it by the output of the variable gain amplifier (RV).

4,593,348

DEVICE FOR THE GENERATION OF REGULATED AND/OR ADJUSTABLE DIRECT VOLTAGES OR DIRECT CURRENTS

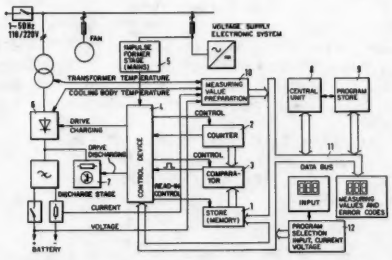
Werner Tewesmeier, Seelze, Fed. Rep. of Germany, assignor to Autola Stromrichter GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 600,500

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313944

Int. Cl.[4] **H02P** *13/24;* **G05F** *1/44*

U.S. Cl. 363—85 **6 Claims**



1. A device for the generation of regulated and/or adjustable direct voltage or direct currents with use of semiconductor elements in the form of thyristors or power transistors, with an impulse generator for the generation of synchronizing impulses of prescribed frequency, with an actual value giver controlled according to provision of the impulse generator, with a desired value giver that delivers desired values which are a measure for the required direct voltage or for the required direct current, and with a comparison circuit which compares the output of the actual value giver with the desired values and on equality delivers in each case a drive signal for the semiconductor element, characterized in that the device forms part of a battery maintenance circuit containing a thyristor circuit (6) and a transistor circuit (7) in a system with a controlling computer (8) as desired value giver, a digital memory (1) which makes available on its output the desired values calculated by the controlling computer (8) as a binary number, a binary counter (2) as an actual value giver which counts the beat impulses of the controlling computer, the comparison circuit (3) is formed in such a way that on equality of the numbers of the memory (1) and of the counter (2) it triggers an impulse the time beginning of which corresponds to the ingate angle for the thyristor circuit for the charging of the battery to be maintained, and its duration to the impulse width of a pulse-width modulated signal for the transistor circuit for the discharging of the battery to be maintained, and that a control device (4) is provided which receives control signals from the controlling computer (8), which controls the reading of the desired values into the memory (1) and of the actual values into the counter (2), and which synchronizes the impulses delivered from the comparison circuit (3) with the synchronizing impulses delivered from the impulse generator and drives the semiconductor element, and the control device (4) contains a switch-over arrangement in combination with a locking circuit, which brings about a conduction onward of the signal either only to the thyristors for charging the batteries to be maintained or only to the power transistors for discharging the batteries to be maintained.

4,593,349

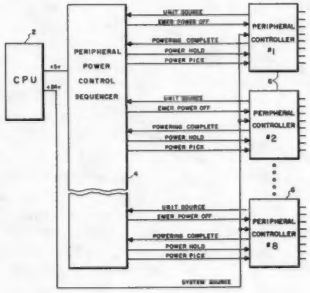
POWER SEQUENCER

Mark T. Chase, Glendale, and Michael C. Middleton, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation of Ser. No. 400,770, Jul. 22, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 696,215

Int. Cl.[4] **G06F** *15/56*

U.S. Cl. 364—200 **4 Claims**



1. In a computer system, having a central processor unit, a power control sequencer, for sequentially controlling the application of power to a plurality of control units, each control unit controlling a power-up of elements connected to each respective control unit, wherein said central processor unit is connected to each of said control units to supply a first power signal to each of said control units, said power control sequencer comprising:

(a) first sensing means, connected to each of said control units, for detecting a unit source signal from each of said control units to generate a plurality of sense signals, each sense signal corresponding to a respective unit source signal, said unit source signal indicating that the respective control unit is connected in the computer system and has received the first power signal;

(b) first logic means, having a plurality of first input terminals to receive a respective sense signal, and having a plurality of first output terminals to transmit a plurality of pick signals, each pick signal corresponding to a respective sense signal received by said first logic means, for controlling a power application sequence whereby said first inut terminals are sequentially interrogated, and upon detecting the presence of the sense signal at the first input terminal being interrogated, to transmit the respective pick signal to the corresponding first output terminal;

(c) first driver means, having a plurality of second input terminals operatively connected to a respective first output terminal of said first logic means, and having a plural-

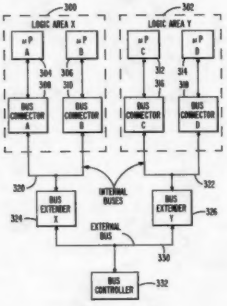
ity of second output terminals, each of said second output terminals connected to a respective control unit, for transmitting a power pick signal in response to the corresponding pick signal, each power pick signal corresponding to the respective pick signal, the power pick signal causing the respective control unit to activate a power-up sequence of the elements controlled by the control unit.

4,593,350

DISTRIBUTED PROCESSOR WITH PERIODIC DATA TRANSFER FROM EACH MEMORY TO LIKE ADDRESSES OF ALL OTHER MEMORIES

Renzo D. Mitchell, Cherry Hill; Don N. Thomas, Haddonfield, both of N.J., and Richard J. Smith, Fairfax Station, Va., assignors to RCA Corporation, Princeton, N.J.

Filed May 25, 1983, Ser. No. 498,101
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **1 Claim**



1. A computer system including a plurality of data processing stations each including a signal processing portion which interchanges data with a random access memory portion having a plurality of addressable word locations, and each of which also includes a signal processing interrupt function and an interrupt input terminal therefore, word location accessing logic means responsive to a word address signal to access a selected random access memory word location, read/write control logic for controlling the reading of data from and the writing of data into said random access memory, and a distributive bus system interconnecting said plurality of data processing stations, comprising:

a bus controller for generating, and a bus for distributing, a plurality of control signals including periodic halt signals for interrupting said signal processing of said data processing stations, a plurality of time sequential data processing station address signals occurring during each said halt signal, time sequential word address signals occurring during each said data processing station address signal, and read/write signals occurring during each said word address signal;

first coupling means coupled to said bus system and to each said data processing station for simultaneously coupling said halt signals to said interrupt input terminal of each said data processing station for halting signal processing for the duration of each said halt signal;

decoding means coupled to each of said data processing stations and to said bus system and responsive to said data processing station address signals, each of said decoding means generating a first output signal during those intervals in which that data processing station to which it is coupled is addressed and generating a second output signal during those intervals in which that data processing station to which it is coupled is not addressed;

first gating means coupled to each of said data processing stations, to each of said decoding means and to said bus system and responsive to the simultaneous occurrence of said halt signal, said read/write signal and said first output signal from said decoding means to supply a read signal to said read/write control logic, and responsive to the simultaneous occurrence of said halt signal, said read/write signal and said second output signal from said decoding means to supply a write signal to said read/write control logic whereby said random access memory portion of that data processing station which is addressed is enabled for reading and said random access memory portion of those data processing stations which are not addressed are enabled for writing;

second gating means coupled to each of said word location accessing logic means and to said bus system and responsive to the simultaneous occurrence of said halt signal and said word address siggic means and to said bus system and responsive to the simultaneous occurrence of said halt signal and said word address signals for accessing the corresponding random access memory word location whereby the word in the memory location so accessed is read from the random access memory portion of that data processing station which is addressed and the memory location so accessed in the random access memory of those data processing stations which are not addressed is made available for writing; and

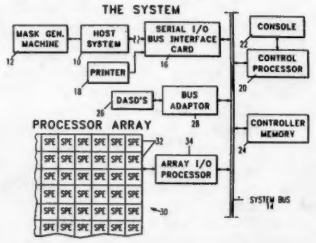
third gating means coupled to said random access memory portion of each of said data processing stations, to said decoding means and to said bus system and responsive to said decoding means for coupling each word read from said random access memory portion of that data processing station which is addressed to a particular portion of said bus system in response to said first output signal of said decoding means and for coupling each word on said particular portion of said bus system to said random access memory portion of those data processing stations which are not addressed for writing.

4,593,351

HIGH SPEED MACHINE FOR THE PHYSICAL DESIGN OF VERY LARGE SCALE INTEGRATED CIRCUITS

Se J. Hong, Yorktown Heights; Ravindra K. Nair, Peekskill, both of N.Y., and Eugene Shapiro, Stamford, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 272,880, Jun. 12, 1981, Pat. No. 4,484,292. This application Jun. 18, 1984, Ser. No. 621,988
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **2 Claims**



1. A multiple-instruction multiple-data stream processing array comprising;

a control processor for providing the storing and coordinating functions for said processing array, including multiple column and row selection at a given time;

a plurality of multiple-instruction multiple-data stream processing elements, with each processing element being directly connected to at least the four adjacent processing elements for asynchronous communication therewith, and each processing element including:

at least four data input storage means, to respectively directly store data from said at least four adjacent processing elements in said array;

a data output storage means, to store data which is to be directly provided to said at least four adjacent processing elements in said array;

a control data input storage means, to store data which is provided from said control processor;

a control data output storage means, to store data which is to be provided to said control processor;

at least four flag latches for indicating the flow of information between processing elements, and which are responsive to respective strobe signals indicating when another one of said at least four adjacent processing elements has directly stored data into one of the at least four data input storage means, and for informing said another one of said at least four processing elements that said one of said at least four data input storage means has received said data;

strobe signal output means for indicating when the data stored in said data output storage means is transmitted to another one of said at least four elements in said array;

a control input latch, responsive to a control signal from said control processor which is indicative of data being stored in said control data input storage means from said control processor; and

computing means which operate in response to programs stored therein, and responsive to control signals provided from said control processor to process at least the data stored in said at least four data input storage means and said control data input storage means.

4,593,352
METHOD AND DEVICE FOR EXCHANGING INFORMATION BETWEEN TERMINALS AND A CENTRAL CONTROL UNIT

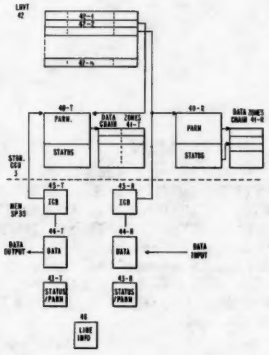
Rene Castel, Tourette sur Loup; Jean-Louis Calvignac, LaGaude, both of France, and Wilburn D. Draper, Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,401

Claims priority, application European Pat. Off., Mar. 24, 1982, 82430008.1

Int. Cl.[4] G06F *13/28*

U.S. Cl. 364—200 **16 Claims**



1. In a communication controller of the type comprising a central control unit (CCU) connected to a control unit storage (3), part of which is used for storing a network control program, said central control unit being connected through an input/output interface (IOC) to an input/output bus (IO-5) to which are attached, on the one hand, communication line adapters (SP,S) including a microprocessor (SP) and a storage (35), and, on the other hand, at least one central processing unit (CPU), with the central control unit communicating with the adapters by means of cycle steal transfer operations (AIO) and input/output program initiated operations (PIO) a method of exchanging information, characterized in that it includes the steps of:

during initialization:

causing the network control program to set up in the storage of the control unit a correspondence table (42) from a predetermined starting address, said table including first and second address positions for each communication line, with each position storing the address of an area (40) of the central control unit storage reserved for storing parameter, status and data information corresponding to the transmit interface and to the receive interface of each communication line,

transferring the starting address to each adapter by means of a first set of output program initiated operations,

for a first communication:

causing the central control unit to send for each line interface, by means of an output program initiated operation termed start line initial, a first code (SELECT LAD) specifying the address of an adapter to be selected,

causing the adapter that recognized its address to send an acknowledgement signal and to become selected, and storing the first code in the adapter,

causing the central control unit to send a second code specifying the address of a selected interface of a selected line (SPIA) and an initialization command to the selected interface,

causing the microprocessor of the adapter to calculate the correspondence table address corresponding to the selected interface of the selected line as a function of the first and second codes and the starting address of the correspondence table, so as to cause the transfer in cycle steal mode of the information contained at this address in a control block associated with a microprocessor storage location area assigned to the interface of said line for storing parameter, status and data information relative to the said interface,

causing the information to be exchanged in cycle steal mode between the area assigned to the selected interface in the central control unit storage and the microprocessor storage location area assigned to the interface,

for operations in the normal exchange mode on a selected interface;

causing the central control unit to send, by means of an output program initiated operation termed start line, the first code specifying the address of the adapter to be selected,

causing the adapter that recognized its address to send an acknowledgement signal and to become selected,

sending the code specifying the address of the selected interface used by the selected adapter to locate the control block in the microprocessor storage containing the address of the area in the central control unit storage assigned to the interface and a message transfer command to this interface,

exchanging information to be exchanged in cycle steal mode between the area located at the address contained in said located control block and the area assigned to the selected interface in the microprocessor storage.

4,593,353
SOFTWARE PROTECTION METHOD AND APPARATUS

Andrew Pickholtz, Fairfax, Va., assignor to Telecommunications Associates, Inc., Fairfax, Va.

Filed Oct. 26, 1981, Ser. No. 315,050

Int. Cl.[4] G06F *12/14*

U.S. Cl. 364—200 **2 Claims**

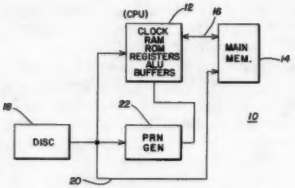
1. A software protection apparatus using first and second authorization codes and a pseudorandom number, said software protection apparatus for use with a computer, comprising:

an external memory device having computer software and a

first authorization code and a second authorization code at selected data locations, wherein said second authorization code is part of a pseudorandom sequence;

means for reading said external memory device, said reading means located in the computer;

pseudorandom number generator device located in the computer and coupled to said reading means, for generating a pseudorandom number in response to said reading means reading said first authorization code from said external memory device, said first authorization code being read prior to execution of said computer software, said pseudorandom number generator device including a sealed cas-



ing, thereby preventing identification of the pseudorandom number generator algorthim;

processing means located in the computer and coupled to said reading means and said pseudorandom number generator device, for comparing the pseudorandom number generated by said pseudorandom number generator device with the second authorization code read from selected data locations in said external memory device, said processing means generating an enable signal in response to a positive comparison of the pseudorandom number with the second authorization code for enabling execution of the computer software stored in said external memory device.

4,593,354

DISK CACHE SYSTEM

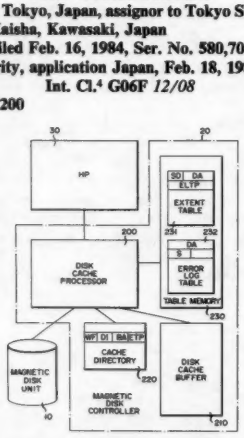
Sotaro Ushiro, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 16, 1984, Ser. No. 580,703

Claims priority, application Japan, Feb. 18, 1983, 58-25773

Int. Cl.[4] G06F *12/08*

U.S. Cl. 364—200 **8 Claims**



1. A disk cache system comprising;

a host processor;

a disk unit; and

a disk controller interposed therebetween and incorporating therein a disk cache buffer,

said disk controller having

a cache directory for controlling said disk cache buffer in units of blocks of a predetermined size and having write flags in respective entries,

an error log table in which error status information is set,

an extent table having entries in which file extent information is set,

first means, responsive to a first command generated from the host processor and having file extent information defining a file area, for setting the file extent information in the extent table and for securing a corresponding area in said disk cache buffer,

second means, responsive to a second command generated from said host processor and requesting write into said disk unit, for storing data into the corresponding area of said disk cache buffer and for setting the write flag of a corresponding entry of said cache directory,

third means for writing into said disk unit data in said disk cache buffer which has not been written in said disk unit utilizing an idle time of input/output processing using said disk cache buffer and for resetting the write flag of the corresponding entry of said cache directory,

fourth means, responsive to a third command generated from said host processor, having the file extent information, and designating a logical termination unit of a program, for writing into said disk unit data corresponding to a file area represented by the file extent information in said third command and for resetting the write flag of the entry of said cache directory, said data being selected from the data in said disk cache buffer which has not been written in said disk unit,

fifth means, when an error is generated during data write into said disk unit, for setting the error status information into said error log table such that said error status information corresponds to the file extent information stored in said extent table and defining file areas including an area in which the data is to be written, and

sixth means, upon being initiated after termination of a control operation of said fourth means, for selectively fetching from the error log table the error status information corresponding to the file extent information in the third command and transferring the error status information to said host processor.

4,593,355

METHOD OF QUICK BACK PROJECTION FOR COMPUTED TOMOGRAPHY AND IMPROVED CT MACHINE EMPLOYING THE METHOD

Richard C. Chase, Tewksbury, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Nov. 21, 1983, Ser. No. 554,024

Int. Cl.[4] G01T *1/16*; H04N *5/32*; G01N *23/00*; G06G *7/60*

U.S. Cl. 364—414 **22 Claims**

1. A method of imaging comprising the steps of:

a. detecting line of sight absorption data from a slice of an object illuminated by sets of line of sight x-rays, each said set angularly displaced from other sets,

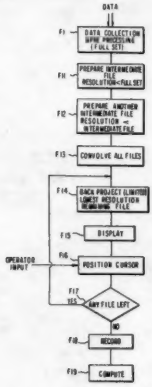
b. storing said line of sight absorption data,

c. transforming said stored data into a coarse mesh map of elemental relative absorption data corresponding to a cross-section of said object consisting of said slice,

d. displaying an image representing said map,

e. selecting a region of said image significantly smaller in dimensions than said image, for further processing,

f. transforming portions of said stored data into a fine mesh map of elemental relative absorption data corresponding



to the reduced portion of said image identified in step (e), and

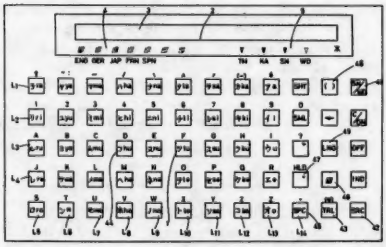
g. displaying an image representing said reduced map.

4,593,356

ELECTRONIC TRANSLATOR FOR SPECIFYING A SENTENCE WITH AT LEAST ONE KEY WORD

Shintaro Hashimoto, Ikoma; Masafumi Morimoto, Yamatokoriyama; Kunio Yoshida, Nara; Hisao Morinaga, Shiki; Tosaku Nakanishi, Nara, and Shigenobu Yanagiuchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1981, Ser. No. 283,961
Claims priority, application Japan, Jul. 23, 1980, 55-102997
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 **10 Claims**



1. A system for translation between source and target language comprising:

input means for entering a key word in the source language and for selecting a subject category relating to the subject of the translation;

first memory means for containing sentences in said source language, said source language sentences being arranged according to subject category;

second memory means for containing sentences in said target language, said target language sentences being arranged in said second memory means with addresses corresponding to the addresses of the source language sentences in said first memory means having the same meaning;

first addressing means responsive to said input means for selecting an address location in said first memory means corresponding to the beginning of the selected subject category;

search means responsive to said input means and said first addressing means for searching said first memory means and comparing said entered key word to the words of the sentences within said selected subject category in said first memory means, said search means identifying a sentence containing said key word and its associated address;

said first addressing means incrementing said address location by one after each comparison by said search means until said search means identifies said sentence containing said key word and its associated address;

second addressing and retrieval means for accessing the target sentence located at the address in said second memory means corresponding to the address of the sentence in said first memory means containing the key word and retrieving said target sentence; and

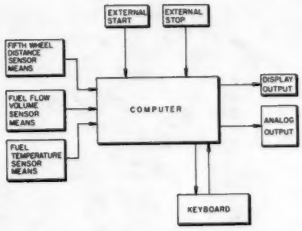
display means responsive to said second addressing and retrieval means for presenting said target sentence to the user of the system.

4,593,357

MOTOR VEHICLE PERFORMANCE MONITORING SYSTEM

William F. Van Ostrand, and Jeffrey M, Sylvia, both of Hagerstown, Ind., assignors to Laboratory Equipment Corp., Mooresville, Ind.

Filed Feb. 19, 1982, Ser. No. 350,168
Int. Cl.[4] G06F *11/32, 15/20*
U.S. Cl. 364—424 **54 Claims**



47. A motor vehicle performance monitoring system which measures motor vehicle performance characteristics, said system comprising:

motor vehicle performance sensor means operable (1) to sense motor vehicle performance characteristics and further operable (2) to produce data signals corresponding to the motor vehicle performance characteristic sensed;

computer means arranged to operate based upon a set of computer parameters, said computer means being electrically connected with said sensor means and operable to receive as input said data signals and to calculate motor vehicle performance characteristic calculations from said data signals;

said computer parameters include a (1) calculation starting parameter that is used by said computer means to determine that the computer means should begin to calculate motor vehicle performance characteristic calculations from said data signals and a (2) calculation stopping parameter that is used by said computer means to determine that the computer means should stop calculating motor vehicle performance characteristic calculations from said data signals;

data output means electrically connected with said computer means, said data output means being operable to

produce output data corresponding to various motor vehicle performance characteristics and types of measurements of said characteristics; and

programming control means electrically connected with said computer means and said programming control means being operable (1) to select computer parameters to be set and to set the computer parameter selected to a particular value and operable (2) to select the particular output data corresponding to a motor vehicle performance characteristic to be set and to set the output data selected to a particular type of measurement of said characteristic;

said proramming control means includes a keyboard operable (1) to select computer parameters desired to be set by a user and to set the computer parameter selected to a value by a user and (2) to select the particular output data corresponding to a motor vehicle performance characteristic to be set by a user and to set the output data selected to a particular type of measurement of said characteristic by a user; and

said keyboard includes electrically energizable prompting means operable to aid the user to readily operate the keyboard; and said computer means include default parameter means operable to set said computer parameters to a default setting.

4,593,358

METHOD AND APPARATUS FOR CONTROLLING POWER STEERING

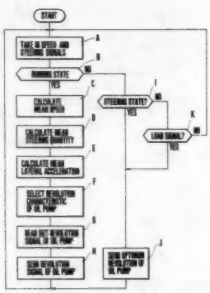
Sadao Takeshima, and Takeshi Ohe, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Toyko, Japan

Filed Sep. 27, 1983, Ser. No. 536,918

Claims priority, application Japan, Sep. 30, 1982, 57-172387

Int. Cl.[4] B62D *5/04, 5/06;* **G05D** *13/02*

U.S. Cl. 364—424 **4 Claims**



2. Power steering control apparatus utilizing an oil pump comprising:

a car speed sensor producing a car speed signal;

a sensor producing a steering signal representing a steering quantity of a steering wheel of a car;

a mean car speed calculating circuit calculating a mean car speed based on said car speed signal;

a mean steering quantity calculating circuit calculating a mean steering quantity based on said steering signal;

a mean lateral acceleration calculating circuit calculating a mean lateral acceleration based on said mean car speed and said mean steering quantity thus calculated;

a car speed calculating circuit calculating a car speed in accordance with said car speed signal;

pattern memory means storing a plurality of number of revolutions characteristics of the oil pump corresponding to different patterns showing relations between the car speed and the number of revolutions of said oil pump as the car runs;

a selection circuit selecting one of said number of revolutions characteristics in accordance with said mean lateral acceleration and said mean car speed;

means for deriving out a number of revolutions signal of said oil pump corresponding to said car speed in accordance with an output of said car speed sensor; and

control means controlling rotation of said oil pump in accordance with said derived out number of revolutions signal of said oil pump.

4,593,359

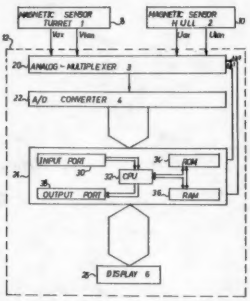
VEHICLE NAVIGATION SYSTEM

Ilan Sadeh, 13 Herzog St., Tel-Aviv, Israel

Filed Jun. 24, 1983, Ser. No. 507,571

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—443 **7 Claims**



1. A navigation system particularly useful for a vehicle including two relatively movable parts having individual and mutual magnetic-field disturbing characteristics inherent in its construction, comprising:

two magnetic-field sensors each mounted on one of said parts of the vehicle and outputting electrical signals corresponding to the measured azimuth of the two parts of the vehicle;

an analog-to-digital converter for converting said output signals to digital values;

and a microcomputer including a storage device having stored therein two look-up tables, each in the form of a matrix of correction factors for the various azimuth positions of each relatively movable part of the vehicle; input means for inputting the digital values corresponding to the measured azimuth of the two parts of the vehicle; computer means programmed to compute from the measured values and said stored look-up tables the true azimuth values; and output means for outputting said true azimuth values.

4,593,360

FLUID SPRAY CONTROL SYSTEM

Eric H. Cocks, 4100 Galt Ocean Dr., Fort Lauderdale, Fla. 33308

Filed Dec. 16, 1983, Ser. No. 562,081

Int. Cl.[4] G06F *15/46;* **B05B** *5/02*

U.S. Cl. 364—468 **5 Claims**

1. A control system for spraying a fluid onto a workpiece comprising:

fluid spray apparatus;

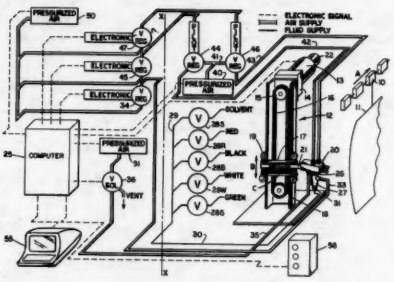
computer controlled means for supplying to said fluid spray apparatus, at a predetermined pressure, the fluid to be sprayed by said fluid spray apparatus;

computer controlled means for supplying to said fluid spray apparatus, a first gas at a predetermined pressure for atomizing the fluid to be sprayed;

computer controlled means for supplying to said fluid spray

apparatus, a second gas at a predetermined pressure for adjusting the size of the fan of the spray from the spary apparatus; and,

said computer controlled fluid spray supply means comprising a pilot operated regulating valve located substantially adjacent to said fluid spray apparatus, having a fluid inlet port, a fluid outlet port and a pilot port, said fluid to be



sprayed being flow connected to said fluid inlet port and said fluid outlet port being flow connected to said spray apparatus, an electronic regulating valve flow connected to a pressurized gas at its inlet and flow connected to said pilot valve at its pilot port, and a computer, said computer being electronically connected to said electronic regulating valve.

4,593,361

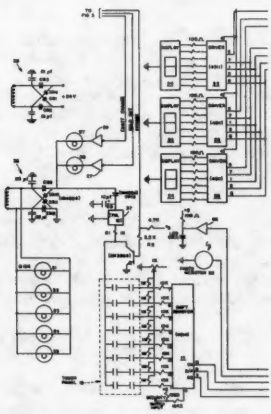
VENDING MACHINE CONTROL CIRCUIT

David M. Otten, Newton, Mass., assignor to PepsiCo Inc., Purchase, N.Y.

Division of Ser. No. 431,613, Sep. 30, 1982, Pat. No. 4,481,590, which is a division of Ser. No. 159,625, Jun. 16, 1980, Pat. No. 4,372,464. This application Sep. 7, 1984, Ser. No. 648,789

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—479 **3 Claims**



1. A vending machine for vending of products to customers during vending operations and having a plurality of control switches on a control panel for allowing customers to operate the machine during vending operations, including a plurality of product selection switches and a coin return switch, and a vending machine control circuit having logic means therein, including:

(a) a memory for storing data therein, including the vend prices of products offered for sale in the machine, and for also storing therein a vending program for controlling the operation of the vending machine during vending operations and also a servicing program for controlling the operation of the vending machine during vending machine servicing operations, including product price setting operations, performed by a service person;

(b) means for entering data into said memory, including a service switch accessible to a service person, and inaccessible to customers during vending operations of the machine, for calling from memory said servicing program which enables at least one of said control switches on the vending machine customer control panel to be used by a service person during vending machine service operation to enter data into memory, said control switches being utilized during said servicing program by utilizing said coin return switch to increment the price displayed on the available credit display each time the coin return switch is actuated by the service person, and utilizing the product selection switches to enter the price displayed on the available credit display into memory as the vend price for a particular product when the product selection switch for that product is actuated by the service person.

4,593,362

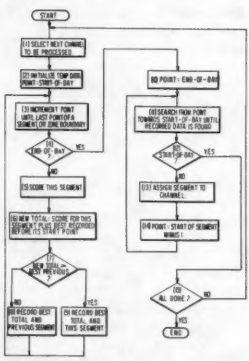
BAY PACKING METHOD AND INTEGRATED CIRCUIT EMPLOYING SAME

Paul H. Bergeron; Kurt D. Carpenter, both of Chittenden County, Vt.; Jerome B. Hickson, Jr., Yorktown Heights, N.Y.; Roger K. Jackson, Longmont, Colo.; Keith W. Lallier, and Elba K. Malone, both of Chittenden County, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 16, 1983, Ser. No. 495,021

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—488 **24 Claims**



1. A method of producing an integrated circuit comprising a plurality of circuits and at least one wiring bay comprising a plurality of wiring channels, said wiring bay having first and second ends and said wiring channels extending adjacent one another between said first and second ends, said circuits being interconnected by wiring segments disposed in respective channels, each wiring segment having start and end points, said method comprising the steps of assigning to each of said circuits a location in said integrated circuit, packing said wiring bays by assigning wiring segments to respective ones of said channels to obtain an integrated circuit design, and fabricating said integrated circuit in accordance with said integrated circuit design, said packing step comprisng:

A. selecting an unpacked channel from among said wiring channels;

B. assembling a list of segments available for packing on that channel;

C. for the channel selected in said step A:

(1) assigning a score to each of said available segments;

(2) starting from said first end of said wiring bay and moving toward said second end of said wiring bay, upon occurrence of an end point of any segment, determining a total score for said selected channel by adding to the score of said any segment a best string score for any string of segments at last end point of which occurs before a start point of said any segment;

(3) if said total score exceeds a present value of a best string score for any string of segments, retaining said total score as a new value of said best string score for any string of segments and recording an identifier for said any segment, otherwise retaining said present value of said best string score for any string of segments;

(4) repeating said steps (2) and (3) until said second end of said wiring bay is reached and a final best string score is obtained, said final best string score corresponding to a final string of segments comprising those segments for which identifiers have been recorded in said step (3);

(5) from said second end of said wiring bay and moving toward said first end of said wiring bay, assigning to said selected channel at last segment in said final string for which an identifier was recorded in said step (3) and which has not yet been assiged to said selected channel; and

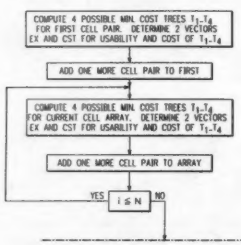
D. repeating said steps A to C until all said segments have been assigned to a channel.

4,593,363

SIMULTANEOUS PLACEMENT AND WIRING FOR VLSI CHIPS

Michael Burstein, Carmel; Se J. Hong, Yorktown Heights, and Richard N. Pelavin, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1983, Ser. No. 522,900
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—491 **16 Claims**


COMPUTE 4 POSSIBLE MIN. COST TREES T_1-T_4 FOR FIRST CELL PAIR. DETERMINE 2 VECTORS EX AND CST FOR USABILITY AND COST OF T_1-T_4
ADD ONE MORE CELL PAIR TO FIRST
COMPUTE 4 POSSIBLE MIN. COST TREES T_1-T_4 FOR CURRENT CELL ARRAY. DETERMINE 2 VECTORS EX AND CST FOR USABILITY AND COST OF T_1-T_4
ADD ONE MORE CELL PAIR TO ARRAY
YES
I ≤ N
NO

9. A computerized system for automatically placing components of a logic network on a master-slice VLSI chip and integrally globally determining the wiring connections of a wiring network to said components, comprising:

means for determining the number of elementary cell rows and columns available on the area of said chip and the available wiring tracks per said rows and columns;

assignment means for determining the set of components of said logic network to be placed and respectively assigning subsets thereof successively to a hierarchy of sets of said elementary cells;

analysis means for performing a placeability analysis to determine whether all components of each said subset can be placed in the respective assigned cell set;

wiring connection means for globally determining the wiring connections for subnetworks of said wiring network to the components within said subsets and over the wiring tracks between said subsets for each of said hierarchical sets of cells; and

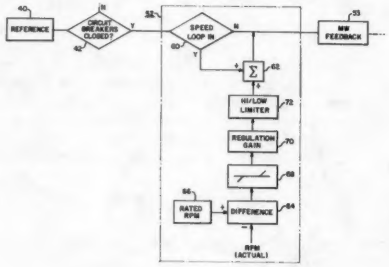
partitioning means for iteratively actuating said assignment means, said analysis means and said wiring connection means beginning with two sets of elementary cells and continuing by successively subdividing said sets of elementary cells through successive levels until the number of said cell sets equals said number of elementary cells, whereupon the component placement and global wiring are complete.

4,593,364

FLOATING DEADBAND FOR SPEED FEEDBACK IN TURBINE LOAD CONTROL

William D. Ghrist, III, Blawnox, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1983, Ser. No. 538,389
Int. Cl.[4] H02P *9/04*
U.S. Cl. 364—494 **5 Claims**



1. In a steam turbine-generator power system operable in a speed and load control mode of operation and wherein a load reference setpoint is generated to control steam admission valves to the turbine during load control and wherein said turbine has a rated speed, the improvement comprising:

(A) means for obtaining an indication of actual turbine speed;

(B) means for obtaining a speed error signal indicative of the difference between rated and actual turbine speed;

(C) means for generating a corrective signal if said speed error signal exceeds a preset speed error deadband;

(D) means for shifting said deadband each time a new corrective signal is generated; and

(E) means for modifying said load reference setpoint by said corrective signal.

4,593,365

APPARATUS AND METHOD FOR MONITORING A PLURALITY OF FLOW METERS

John E. Haley, Jr.; Michael J. Lynch, and Charles L. Mouser, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 6, 1983, Ser. No. 482,686
Int. Cl.[4] G01F *15/075*
U.S. Cl. 364—510 **6 Claims**

5. An apparatus for monitoring a plurality of flow meters at a well site, said flow meters providing respective electrical signals proportional to the flow rates of substances flowing past said flow meters, said apparatus comprising:

a portable housing adapted for use at said well site;

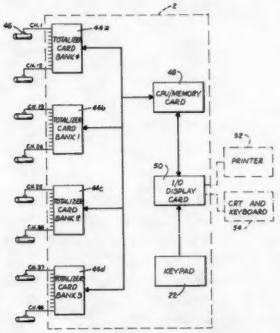
a plurality of data concentrator means, contained within said housing, for polling said flow meters, each of said data concentrator means including:

receiver means for receiving a respective number of the respective electrical signals in respective channels, each of said channels connectible with a respective one of the

flow meters, and for conditioning said electrical signals into corresponding digital signals having numbers of pulses proportional to the respective flow rates; and

counter means, having a plurality of storage locations, for repeatedly polling said channels and for counting and storing in respective ones of said plurality of storage locations the counts of pulses of said digital signals detected in each of said channels during the last one of the pollings;

one, and only one, central processing means, contained within said housing, for obtaining said counts from said



storage locations and for determining therefrom for each channel individual flow rates of the substances and for determining for each channel the total volumes of the substances flowing past said flow meters and for determining the sum of said individual flow rates and the sum of said total volumes; and

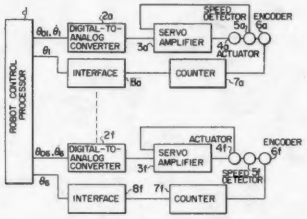
display means, mounted on said housing and connected with said one and only one central processing means, for displaying said individual flow rates, said total volumes, said sum of individual flow rates, and said sum of total volumes.

4,593,366

METHOD OF CONTROLLING ROBOT

Koichi Sugimoto, Hiratsuka, and Tsugio Sekine, Hasuda, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 482,022
Claims priority, application Japan, Apr. 5, 1982, 57-55423
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—513 **18 Claims**



1. A method of controlling a robot, comprising the steps of:

detecting the displacement of each of a plurality of kinematic pairs of a detector, said kinematic pairs being included in a robot;

calculating the present spatial position of a hand of said robot on the basis of said detected displacement of each kinematic pair;

calculating a deviation between said present position of said hand and a set position to be occupied by said hand;

determining a speed of said hand in accordance with said deviation;

calculating a desired intermediate position of said hand between said present position and said set position in dependence upon said speed of said hand if said hand moves from said present position at said speed after a predetermined time;

calculating a desired displacement value for each of said kinematic pairs on the basis of said desired position of said hand; and

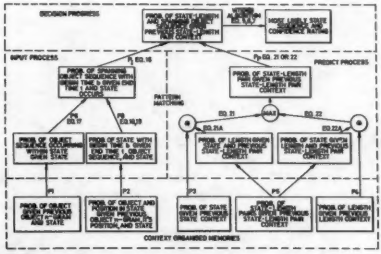
controlling an actuator on the basis of the calculated displacement value for each of said kinematic pairs to drive each of said kinematic pairs.

4,593,367

PROBABILISTIC LEARNING ELEMENT

Thomas B. Slack, Oxford, and Jeffrey N. Denenberg, Trumbull, both of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,230
Int. Cl.[4] G09C *00/00*; G06F *7/22, 1/00*; G06K *9/62*
U.S. Cl. 364—513 **14 Claims**



1. A probabilistic learning element, that sequentially receives objects and outputs sequences of recognized states, said learning element comprising:

means for sequentially receiving objects;

means for storing,

said received objects,

sequences of received objects,

previously learned sequences of states,

states contained in said previously learned sequences of states, and

predetermined types of knowledge relating to,

said previously learned sequences of states,

said states contained in said previously learned sequences of states,

objects contained in said previously learned sequences of states, and

sequences of objects contained in said previously learned sequences of states, whereby current object information relating to

said received objects and said sequences of received objects is stored as well as statistical information relating to previously learned sequences of states and said states, objects and sequences of objects contained in said previously learned sequences of states;

means for correlating said stored current object information with said stored statistical information for assigning probabilities to possible next states in the sequence of recognized states;

means, responsive to said probabilities of possible next states, for determining a most likely next state;

means, responsive to the stored current object information and statistical information, for providing a signal corresponding to the probability that a state has ended; and

means, responsive to said end of state signal, for outputting

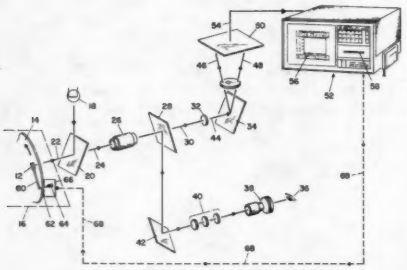
said most likely next state as a recognized next state in a recognized state sequence.

4,593,368

TECHNIQUE FOR MEASURING VERY SMALL SPACINGS

D. Alan Fridge, Glendale, and Kenneth A. Miller, Simi Valley, both of Calif., assignors to Kollmorgen Technologies Corporation, Melville, N.Y.

Filed Jun. 4, 1984, Ser. No. 617,123
Int. Cl.[4] G01B *11/14*
U.S. Cl. 364—525 **29 Claims**



1. A method for determining the distance or spacing between a magnetic reading head and a hard magnetic storage disk, comprising the steps of:

temporarily replacing the magnetic storage disk with a transparent disk having a surface mounted in substantially the same location relative to at least one magnetic reading head, as the recording surface of the hard disk;

rotating the transparent disk at substantially the normal rotational velocity of said magnetic recording disk, with the magnetic head being mechanically biased toward said transparent disk, whereby the magnetic head is spaced away from said transparent disk by a distance determined by the outward force of the air pressure resulting from rotation of the transparent disk balanced against the inward mechanical biasing of the head toward the disk;

directing a broad spectrum of light through said transparent disk onto said magnetic head;

combining the light reflected from said magnetic head and from the surface of said transparent disk to provide a combined light wave spectral intensity response with constructive and destructive interference at different wavelengths;

detecting and measuring the intensity of the combined light through a broad spectrum of wavelengths, with the detecting of intensity occurring substantially concurrently for the entire spectrum of wavelengths;

correlating the theoretical light intensity vs. wavelength characteristic with the measured combined light intensity vs. wavelength characteristic; and

determining the actual spacing between the magnetic head and the transparent disk from the correlation.

4,593,369

MONITORING SYSTEM FOR A CONTAINER TESTING MACHINE

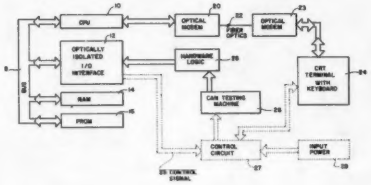
Roger A. Thompson, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Jan. 12, 1983, Ser. No. 457,471
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—552 **11 Claims**

1. A monitoring device for a container testing machine of the type which generates container test data which is properly indicative of potential container production process problems during a normal testing machine operating state and which generates container test data erroneously indicative of potential container production process problems during a defective testing machine operating state and wherein the normal or abnormal operation of the testing machine is ordinarily not readily ascertainable by operating personnel, comprising:

data accumulation means for accumulating container test data produced by said container testing machine;

data analysis means for analyzing said container test data for determining whether said testing machine is in said normal



operating state or said defective operating state and for identifying both potential container production process problems and potential container testing machine problems;

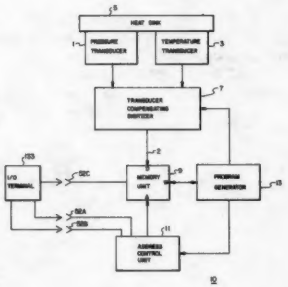
display means for displaying accumulated data produced by said data accumulated means and analysis data produced by said data analysis means to identify potential container production process problems and container testing machine problems.

4,593,370

ENVIRONMENTAL MEASURING AND RECORDING APPARATUS

Hayati Balkanli, P.O. Box 35725, Houston, Tex. 77035

Filed Jul. 26, 1982, Ser. No. 401,972
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.[4] G06F *15/20*; E21B *47/06*
U.S. Cl. 364—571 **12 Claims**



1. An environmental measuring and recording apparatus comprising:

pressure sensing means for sensing of a first environmental condition to obtain a first signal therefrom;

temperature sensing means for sensing of a second environmental condition to obtain a second signal therefrom;

compensation means for compensating the first signal with the second signal to obtain a digital signal thereby;

memory means for storing digital data therein represented by the digital signal; and

program control means for controlling the storage of the

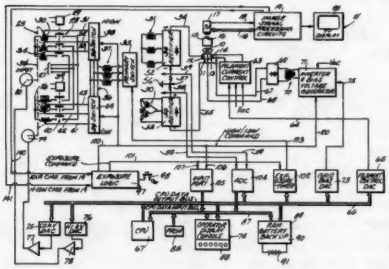
digital data in the memory means and for periodically updating the contents of the memory means.

4,593,371

X-RAY TUBE EMISSION CURRENT CONTROLLER

John P. Grajewski, Palmyra, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1983, Ser. No. 550,825
Int. Cl.[4] G01D *18/00*; H05G *1/44*; G12B *13/00*
U.S. Cl. 364—571 **7 Claims**



1. A method of making and storing a model of the grid bias voltages that must be applied to the control grid of an x-ray tube relative to the filament of the tube to obtain selected x-ray tube currents (mA) through the tube when x-ray exposures of a patient are made later with predetermined kilovoltage kV applied to the anode of the tube and with the filament current of the tube held constant, comprising the stops of:

storing a plurality of digital values representative of trial bias voltages in respective locations in a digital memory at addresses corresponding to desired x-ray tube mA values,

having a programmed digital processor, as a first step in a cycle, access a trial bias voltage digital value at an address corresponding to a selected mA and convert said value to a corresponding analog signal,

using the analog signal to control a bias voltage generator that responds to said signal by applying a corresponding negative bias voltage to said x-ray tube control grid relative to said filament,

having the digital processor calculate the exposure time interval for making an x-ray exposure that yields a predetermined desire milliampere-second (mAS) x-ray dosage,

setting an exposure timer for terminating the ensuing exposure at the end of the calculated time interval after the exposure has been initiated by applying said kV to the anode of the tube,

displaying the actual mAS resulting from the exposure and of there is significant difference between the actual and desired mAS have the processor determine the magnitude of the difference and whether it is above or below the desired mAS and calculate a new trial bias voltage that will cause the bias voltage generator to produce a grid bias voltage that will result in a smaller or no significant difference between the actual and desired mAS when the next exposure is made,

repeating the foregoing cylce, if necessary, until there is no significant difference between actual and desired mAS and then storing the final calculated digital representation of the bias voltage in the memory location at an address corresponding to said selected mA,

selecting other mA values and repeating the steps for determining and storing the bias voltage value to obtain the desired mAS, to develop and store a model of bias voltage verses x-ray tube mA at a predetermined anode kV, and

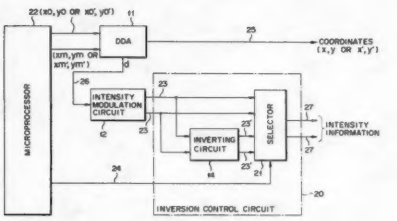
then inhibit input to said memory of digital data that would alter the stored bias voltage values.

4,593,372

LINE GENERATING METHOD

Yoshiaki Bandai, and Khoki Hasebe, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 23, 1983, Ser. No. 554,716
Claims priority, application Japan, Nov. 29, 1982, 57-209025
Int. Cl.[4] G06F *1/02, 3/153*
U.S. Cl. 364—719 **3 Claims**



1. A line generator comprising:

(a) a digital differential analyzer (DDA) generating coordinate data of an interpolated point in accordance with given start and end points and absolute difference data between an actual value and the coordinate data of an interpolated point;

(b) an intensity modulation circuit for generating digital intensity information corresponding to the absolute difference data;

(c) an inversion control circuit for noninverting/inverting a level of an output from said intensity modulation circuit in accordance with a main line/sub-line designating signal; and

(d) a microprocessor for supplying coordinate data of the start point (x_O,y_O) and the end point (x_m,y_m) to said digital differential analyzer, to supply to said inversion control circuit a main line/sub-line designating signal indicating said main line, for determining that a vector direction from the start point (x_O,y_O) to the end point (x_m,y_m) belongs to one of four areas divided by lines $y=x$ and $y=-x$ when the start point (x_O,y_O) is defined as an origin of an x-y coordinate system, and for supplying to said digital differential analyzer coordinate data of a start point (x_O',y_O') and an end point (x_m',y_m') which are obtained by moving x or y coordinates of the start point (x_O,y_O) and the end point (x_m,y_m), respectively, by one in accordance with the vector determination.

4,593,373

METHOD AND APPARATUS FOR PRODUCING N-BIT OUTPUTS FROM AN M-BIT MICROCOMPUTER

Akihiro Kiuchi, Tenri, and Shinichi Tanaka, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1983, Ser. No. 521,559
Claims priority, application Japan, Aug. 9, 1982, 57-138715
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—736 **2 Claims**

1. A microcomputer system comprising:

arithmetic and logic unit means for processing m-bit data;

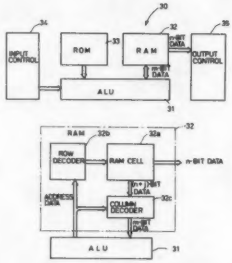
random access memory means for storing the m bit data having a plurality of memory cells that are aligned in a matrix fashion, the number of said memory cells that are aligned in a first direction being greater than or equal to a bit number n;

output control means for latching n-bit data and receiving the n-bit data, where n is greater than m;

addressing means for selecting desired memory cells in said random access memory means, said addressing means including first address means for selecting desired memory cells along said first direction, and second address

means for selecting desired memory cells along a second direction which is different from said first direction in said matrix fashion;

control means includable in said arithmetic and logic unit for selectively enabling said addressing means, whereby m-bit data is read out from the random access memory means



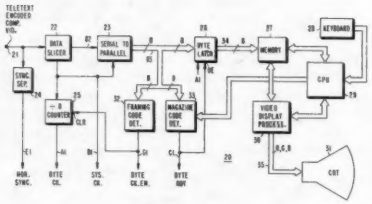
and is applied to said arithmetic and logic unit means when both of said first and second address means are enabled, and n-bit data is read out from the random access memory means and is applied to said output control means when said first address means is enabled and said second address means is disabled.

4,593,374

TELETEXT MAGAZINE CODE DETECTOR

Kadagattor V. Gurumurthy, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 18, 1983, Ser. No. 543,058
Int. Cl.⁴ G06F *11/10, 15/40*
U.S. Cl. 364—900 **5 Claims**



1. A decoder capable of detecting a sought after item of information in an error-encoded teletext-like signal, comprising:

means for forming incoming bytes of data in response to a transmission of said error encoded teletext-like signal that contains bytes of data encoded using an error code that discloses the presence of an error in the transmission of said teletext-like signal;

means for generating an uncoded binary signal that represents a sought after item of information;

an encoder responsive to said binary signal for generating at an output thereof in accordance with said error code an error encoded byte representing said sought after item of information; and

a detector coupled to the output of said encoder and responsive to said incoming bytes of data for detecting the presence of said sought after item of information in the teletext-like signal.

4,593,375

READ-WRITE PROCESSOR WITH INTERNAL DIAGNOSTIC DATA PATH

Edward Gershenson, Worcester, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed May 16, 1983, Ser. No. 495,363
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—900 **6 Claims**

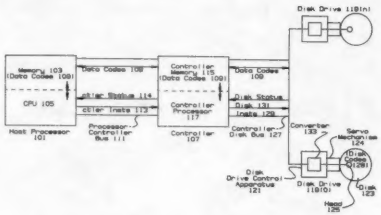


Fig. 1 Digital Data Processing System 100 with Disk Drives

1. Encoding/decoding apparatus comprising:

control means for providing signals controlling operation of said encoding/decoding apparatus;

input means responsive to said signals for receiving in the alternative first codes from a first external device and second codes from a second external device as specified by said signals;

output means responsive to said signals for outputting in the alternative said second codes to said second external device and said first codes to said first external device as specified by said signals; encoding-decoding means responsive to said signals and connected between said input means and said output means for producing said second codes when said encoding-decoding means is receiving said first codes and producing said first codes when said encoding-decoding means is receiving said second codes; and

means responsive to said signals and connected between said input means and said output means for providing said second codes directly from said output means to said input means when specified by said signals, whereby said encoding/decoding apparatus responds to said signals by in the alternative

(a) receiving said first codes in said input means from said first external device, producing said second codes, and outputting said second codes from said output means to said second external device,

(b) receiving said second codes in said input means from said second external device, producing said first codes, and outputting said first codes from said output means to said first external device, and

(c) receiving said first codes in said input means from said first external device, producing said second codes, outputting said second codes from said output means via said data path to said input means, producing said first codes, and outputting said first codes from said output means to said first external device.

4,593,376

SYSTEM FOR VENDING PROGRAM CARTRIDGES WHICH HAVE CIRCUITRY FOR INHIBITING PROGRAM USAGE AFTER PRESET TIME INTERVAL EXPIRES

Larry N. Volk, 3320 Royce Ct., Las Vegas, Nev.

Filed Apr. 21, 1983, Ser. No. 487,018
Int. Cl.⁴ G06F *13/00, 15/44*
U.S. Cl. 364—900 **18 Claims**

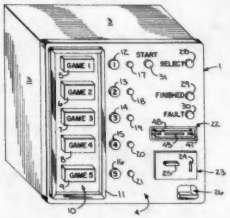
1. A program vending system for dispensing a program which may be used in a separate programmable machine that executes the program, which comprises:

memory means for storing a plurality of programs which are

each suitable for use in the separate programmable machine;

transfer means coupled to the memory means for transferring a selected program to a memory device contained in a program cartridge which is removable from the program vending system;

a use interval circuit contained in the removable program cartridge and coupled to its memory device; and



use programming means coupled to the transfer means for generating a signal to the use interval circuit in the removable program cartridge which establishes a preset use interval for the transferred program;

wherein the transferred program stored in the removable program cartridge may be executed in the separate programmable machine until the preset use interval expires and the use interval circuit prevents further execution.

4,593,377

HIGH-SPEED PROCESSING METHOD OF LINE SEGMENT COORDINATES

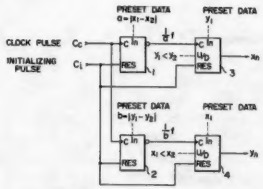
Ikuo Mitsuka, Kusatsu, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 30, 1984, Ser. No. 575,222

Claims priority, application Japan, Feb. 7, 1983, 58-17394

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—900 **3 Claims**



1. A method for processing at high speed line segment coordinates to determine the coordinate values of quantized sequential dots on a line segment connecting desired two points (x_1,y_1), (x_2,y_2) in a two-dimensional quantized coordinate system, which method comprises:

providing counters, each of which employs one quantum unit as the reference clock signal thereof, respectively with the x-axis and y-axis;

controlling reference clock signals, which are to be input to the counters, in accordance with the information on the two points (x_1,y_1), (x_2,y_2); and

employing output values of the counters as coordinate values of the quantized sequential dots.

4,593,378

DIGITAL SIGNAL PROCESSOR

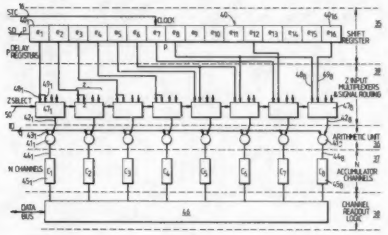
John G. McWhirter; Edward R. Pike, and David J. Watson, all of Malvern, England, assignors to Secretary of State, London, England

Filed Feb. 14, 1983, Ser. No. 466,313

Claims priority, application United Kingdom, Feb. 15, 1982, 8204382

Int. Cl.[4] G06F *15/34;* **H03K** *13/02*

U.S. Cl. 364—900 **13 Claims**



1. A digital signal processor for processing at least one digital signal, said processor comprising:

timing means for receiving an incoming digital signal and for providing a succession of sample intervals containing discrete values forming a digital signal;

delay means connected to said timing means for progressively delaying said digital signal by delay intervals to provide a delayed signal;

an arithmetic section having a plurality of elements, each element arranged to receive from said delay means a differently delayed value of the deplayed signal, each element being connected to receive said digital signal, said plurality of elements performing a mathematical operation between said digital and delayed signals;

an accumulator section having a plurality of channels each connected to one of said elements for accumulating successive compilations by said elements, the channels collectively providing the required mathematical operation;

means for providing to each of said elements from said delay means a differently delayed signal such that the delay interval or sample interval between successive channels increases substantially geometrically, and

control means for controlling the passage of signals through the processor.

4,593,379

METHOD AND A DEVICE FOR SYNCHRONIZATION OF MESSAGES

Pierre Fourcade, and Dominique Dupray, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 6, 1982, Ser. No. 337,408

Claims priority, application France, Jan. 9, 1981, 81 00313

Int. Cl.[4] G01S *1/30*

U.S. Cl. 364—900 **7 Claims**

2. A device for synchronization of messages received by a receiver by means of an adjustable reception clock signal produced by a reception clock signal generator having phase control inputs, each message being constituted by bits transmitted with a bit frequency f and comprising at least one predetermined whole number p of transitions, comprising:

a delay line means for storing received messages;

a circuit for detecting transitiions of received messages;

a high-speed clock signal generator having a frequency N times higher than the bit frequency f of the bits constituting each message;

means for detecting a sign of a phase difference between the detected transitions of the received messages and corresponding reception clock signal transitions, said sign de-

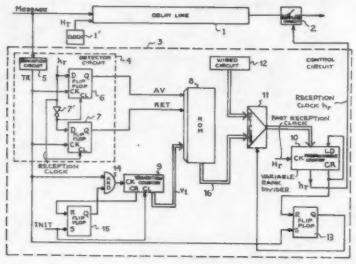
tecting means coupled to an output of the circuit for detecting transitions of received messages and to an output of the reception clock signal generator and having outputs corresponding to the detected sign;

sampling circuit means coupled to the delay line means for sampling the stored messages delivered by the delay line means, by means of the reception clock signal;

means for controlling the phase of the reception clock signal in dependence on the phase of the received messages, comprising,

a reception clock signal generator coupled to the sampling circuit and to the high-speed clock signal generator,

a transition counter connected to an output of said circuit for



detecting transitions of received messages in order to count the number of transitions of the received message, and

a read-only memory having addressing inputs connected to respective outputs of the sign detecting means and to the outputs of the transition counter in order to deliver a control value at each transition i of the received message to phase control inputs of the reception clock signal generator for producing a variation in phase of the reception clock signal by a quantity $\pm A_i(2\pi/N)$ as a function of the sign delivered by the sign detecting means, where A_i of p designates one element of a sequence $N \pm A_i$ decreasing integral values which are stored in the form $N \pm A_i$ within the read-only memory and verifies the equation

$$\sum_{i=1}^{p} a_i A_i = M,$$

where M designates a whole number by which the elementary phase quantity $2\pi/N$ must be multiplied in order to obtain the relative phase shift ϕ between the reception clock signal and the received message to within $2\pi/N$.

4,593,380

DUAL FUNCTION INPUT/OUTPUT FOR A PROGRAMMABLE CONTROLLER

Mark J. Kocher; Ronald E. Gareis; William J. Ketelhut, all of Charlottesville, and Charles E. Konrad, Roanoke, all of Va., assignors to General Electric Co., Charlottesville, Va.

Filed Jun. 4, 1984, Ser. No. 617,162
Int. Cl.[4] G06F *13/00, 1/00, 9/00*
U.S. Cl. 364—900 **16 Claims**

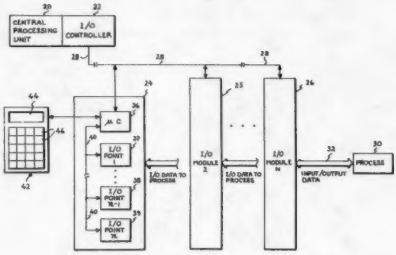
1. In a programmable controller having multiple input and output points for exchanging signals between a controlled process and a central processing unit (CPU) of the controller, circuitry selectively operable either as an input point or as an output point comprising:

an in/out terminal which is electrically common for both input and output connections:

a pair of return terminals, one terminal of which is an input return terminal and one terminal of which is an output return terminal;

preload means connected between said in/out terminal and said output return terminal, operative to provide a status signal indicative of the status of an input device connected between said common terminal and said input return terminal; and

controllable switching means connected between said in/out terminal and said input return terminal, said switching



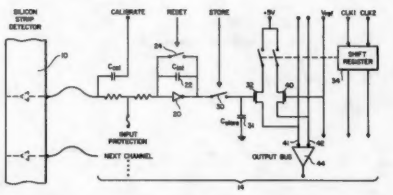
means being operative to be switched on and off for controlling power to an output load connected between said in/out terminal and said output return when such circuitry is operative as an output point and to be held off for provision of said status signal when such circuitry is operative as an input point.

4,593,381

MICROPLEX CHIP FOR USE WITH A MICROSTRIP DETECTOR

Stephen Shapiro, Palo Alto, Calif.; Bernard H. Hyams, Geneva, Switzerland; Sherwood Parker, Berkeley, and James Walker, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 15, 1983, Ser. No. 552,088
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—45 **19 Claims**



1. A single chip integrated system for amplifying and reading out data signals from each strip of a multiple strip microstrip detector wherein a plurality of very low level signal inputs must be substantially simultaneously sampled and amplified, the amplified data samples being sequentially read out on a single line, comprising

a plurality of charge integrator means, one connected to each of said strips for collection of the output charge of each microstrip detector strip with high charge transfer efficiency,

a sample and hold circuit for storing a measure of the total charge value collected in each said strip,

an amplifier for non-destructive readout of the total charge value of each said sample and hold, and

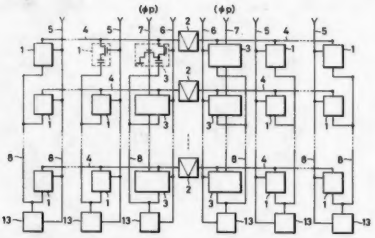
means for serially controlling each of said amplifiers for sequential connection of each sample and hold circuit's signal to the output line to initiate read-out of the stored data.

4,593,382

MOS DYNAMIC MEMORY DEVICE

Kazuyasu Fujishima; Kazuhiro Shimotori; Hideyuki Ozaki, and Takao Nakano, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,911
Claims priority, application Japan, Sep. 16, 1981, 56-147547
Int. Cl.⁴ G11C *11/24*
U.S. Cl. 365—149 **8 Claims**



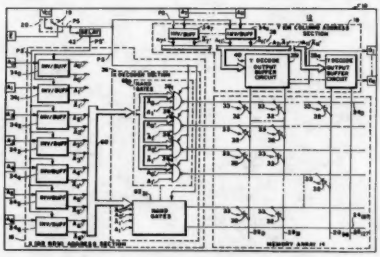
6. An MOS dynamic memory device, comprising: a matrix of memory cells (1) arranged in rows and columns, a plurality of word lines (5) arranged in a column direction of the matrix and individually coupled to each of the memory cells in an associated column, means (17, 18) for driving said word lines, a plurality of bit lines (4) arranged orthogonal to said word lines and individually coupled to each of the memory cells in an associated row, a plurality of memory capacitor cell plates (8) individually associated with the memory cells and connected in columns parallel to said word lines, and means (13) for recharging a selected cell plate after a discharge thereof within a time period during which a word line associated with said selected cell plate remains driven.

4,593,383

INTEGATED CIRCUIT MEMORY

Bruce G. Armstrong, Belmont; Fabio Principi, Cupertino, and John G. Marcellino, Oakland, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 2, 1983, Ser. No. 548,068
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—203 **3 Claims**



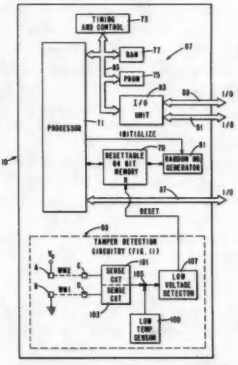
1. An integrated circuit memory comprising:
(a) a substrate coupled to ground potential;
(b) a matrix of memory elements interconnected by rows and columns of conductors, said rows and columns of conductors being disposed on the substrate;
(c) addressing means, coupled between a source of addressing signals and the rows of conductors, for coupling the rows of conductors to a high potential relative to ground potential independent of the addressing signals when such addressing means is decoupled from a power bus and for coupling only a selected one of the rows of conductors to ground potential to address the ones of the memory elements coupled to said selected ones of the rows of conductors when the entire addressing means is coupled to the addressing bus, such one of the rows of conductors being selected in accordance with the addressing signals; and,
(d) switch means, responsive to an enable signal, for decoupling the entire addressing means from the power bus in response to a stand-by condition of the enable signal, for coupling a portion of the addressing means to the power bus when the enable signal changes from the stand-by condition to an enable condition during an initial portion of the enable condition to couple a portion of the rows of conductors to substantially ground potential and for subsequently coupling the entire addressing means to the power bus during a subsequent full enable condition to couple the selected one of the rows of conductors to substantially ground potential to address the ones of the memory elements coupled to such selected one of the rows of conductors, such one of the rows being selected in accordance with addressing signals provided by the addressing signal source.

4,593,384

SECURITY DEVICE FOR THE SECURE STORAGE OF SENSITIVE DATA

Theodoor A. Kleijne, ZA Dreumel, Netherlands, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 21, 1984, Ser. No. 684,637
Int. Cl.⁴ G11C *7/00*; H01L *39/02*; H02H *7/20*; G06K *19/00*
U.S. Cl. 365—228 **18 Claims**

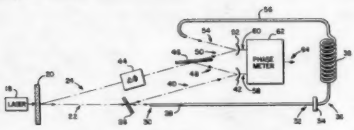


1. A device for the secure storage of sensitive data, said device comprising:
a housing;
a memory contained within said housing for storing sensitive data therein;
low temperature sensing means contained within said housing and being responsive to a decrease in temperature in said housing below a preselected reference temperature for developing a first signal; and
means contained within said housing being responsive to said first signal for clearing said memory of any sensitive data stored therein.

4,593,385
FIBER OPTIC SENSOR LEAD FIBER NOISE CANCELLATION

Jacques R. Chamuel, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Cambridge, Mass.

Filed May 19, 1983, Ser. No. 496,124
Int. Cl.[4] H04R *1/44*; G01B *9/02*
U.S. Cl. 367—149 **5 Claims**



1. An electro-optical system for the detection of a physical property manifest as a pressure effect by means of the interaction of the pressure effect on an optical waveguide, said system comprising:

an optical sensor responsive to pressure effects to vary the optical transmission therethrough;

first and second optical waveguides having said optical sensor in light communicating relationship therebetween to define a first optical path from an end of said first waveguide through said sensor and then through said second waveguide to an end thereof;

a first partially reflecting means located in said first optical path between said first waveguide and said sensor to define a second optical path from the end of said first waveguide through said first waveguide and then by reflection from said first partially reflecting element back through said first waveguide to the end thereof;

said first and second waveguides adapted to experience the same environmental effects;

means for applying light of a first frequency to the end of said first waveguide to produce light along said first and second optical paths respectively appearing at said ends of said second and first waveguides;

said means for applying light also producing;

means for producing a first interference pattern resulting from light on said first path appearing at said end of said second waveguide combined with the light of said second frequency and for producing a second inteference pattern resulting from light on said second path appearing at said end of said first waveguide combined with the light of said second frequency;

first and second photodetector means for sensing the light in said first and second interference patterns respectively to produce first and second output signals; and

means responsive to said first and second output signals for providing an output indication of the pressure effects on said optical senses.

4,593,386
OPTICAL DISC PLAYER WITH IMPROVED TRACKING CONTROL

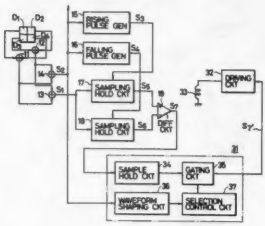
Shinichiro Kuwabara, Tokyo; Kiyoshi Ohsato, Chiba, and Mikio Sugiki, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,912
Claims priority, application Japan, Jul. 10, 1982, 57/120440
Int. Cl.[4] G11B *7/13*, *7/095*
U.S. Cl. 369—46 **6 Claims**

1. An optical disc player in which a reading beam is caused to impinge on an optical disc having thereon an alignment of geometric variations representing recorded information, said reading light beam being modulated in intensity upon reflection by the geometric variations, and in which a photodetector is provided for detecting the reading light beam coming from the optical disc and for generating an output varying in response to the variation in intensity of the detected reading light beam, comprising:

signal producing means for producing from a reflected light beam a reproduced information signal having level variations representing said geometric variations and a tracking error signal having tracking level variations dependent on the effect of the dimensions of said geometric variations on a level of said output of the photodetector;

selective extracting means for detecting a characteristic feature of a selected one of said reproduced information signal and said output of the photodetector, said characteristic feature



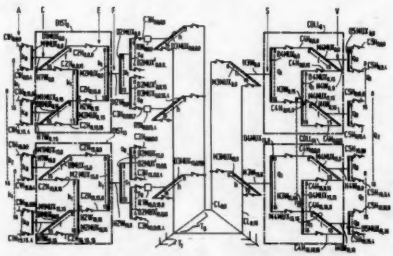
having a predetermined range of values corresponding to those geometric variations having dimensions for which said tracking level variations of said tracking error signal are within predetermined acceptable limits, and for extracting selectively said tracking error signal whenever the value of said detected characteristic feature is within said predetermined range so as to produce a modified tracking error signal having an extracted level; and

control means for performing tracking control in relation to the reading light beam impinging on the optical disc in response to said modified tracking error signal.

4,593,387
TIME DIVISION SWITCHING SYSTEM

Thijs Krol, and Adrianus W. M. van den Enden, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1984, Ser. No. 573,782
Claims priority, application Netherlands, Jan. 27, 1983, 8300290
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **4 Claims**



1. A time division switching system having incoming and outgoing transmission channels for transmission of information contained in bit streams subdivided into bits, the bits from respective incoming transmission channels being distributed to respective outgoing transmission channels by time division multiplex transmission, said switching system comprising: a number N of time division switching stages, a number N of distributors and a number N of collectors; each distributor

having N inputs to each of which an incoming transmission channel is connected and each collector having N outputs to each of which is connected an outgoing transmission channel; each distributor further having N outputs, each of which is connected to an input of each of the time division switching stages, and being adapted to proportionately distribute the bit stream of each incoming transmission channel over the N time division switching stages by multiplexing, distributing and remultiplexing such bit streams according to a predetermined pattern independent of the information contained therein; and each collector further having N inputs, each of which is connected to an output of each of the time division switching stages, and being adapted to collect and proportionately distribute the bit streams for each outgoing transmission channel by multiplexing, distributing and remultiplexing such bit streams according to a predetermined pattern independent of the information contained therein.

4,593,388

SIGNAL PROCESSORS FOR DIGITAL TELEPHONE EXCHANGES

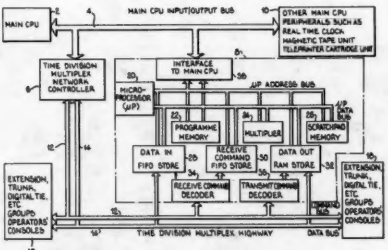
William G. Harris, Leicestershire, and Stuart J. Mason, Nottinghamshire, both of England, assignors to Plessey Overseas Limited, Essex, England

Continuation-in-part of Ser. No. 236,213, Feb. 19, 1981, abandoned. This application Aug. 18, 1983, Ser. No. 524,323

Claims priority, application United Kingdom, Feb. 20, 1980, 8005726

Int. Cl.[4] H04Q *3/545, 11/04*

U.S. Cl. 370—67 **4 Claims**



1. A digital telephone exchange including:

a central processing unit,

a signal pre-processor,

a first bus forming a two-way connection between said central processing unit and said signal pre-processor,

a time division multiplex highway system including a command bus and a data bus,

said signal pre-processor being connected both to said command bus and to said data bus,

subscribers' apparatus connected to said time division multiplex highway system and to said first bus,

a time division multiplex network controller connected to said first bus, and to said command bus and said data bus, said time division multiplex controller including a command bus register for storing the addresses of sources and destinations for data transferred by said data bus, said addresses being input into said command bus register from said central processing unit,

said central processing unit including a first memory in which a number of tasks are recorded, said tasks performing the interrogation of the status of the subscribers' apparatus, and allotting a time slot for said signal pre-processor for operation on signals from a subscriber connected to said subscribers' apparatus, said signal pre-processor including a second memory in which a number of algorithms of routines are recorded, said algorithms being actuated by said central processing unit, for operation on signals received from the subscriber, during the course of a task performed by said central processing unit, in which each algorithm consists of a number of datum words each of which is processed by the signal pre-processor during the time period of a single time division multiplex frame period.

4,593,389

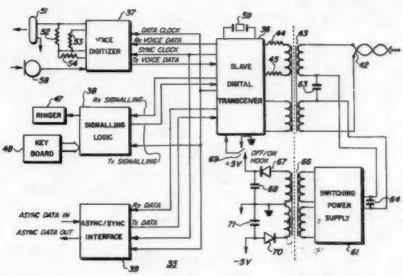
SIMULTANEOUS VOICE AND ASYNCHRONOUS DATA TELEPHONE

Henry Wurzburg, 12506 Wistful Cove, Round Rock, Tex. 78664, and Stephen H. Kelley, 9226 Knoll Crest Loop, Austin, Tex. 78759

Filed Jun. 28, 1984, Ser. No. 625,871

Int. Cl.[4] H04J *3/12*

U.S. Cl. 370—110.1 **4 Claims**



1. A digital telephone for providing simultaneous voice and asynchronous data communication via a two conductor communication channel, comprising:

signalling means for providing a first signal indicating the receipt of a communication link request and a second signal indicating a request for a communication link to a predetermined destination;

transceiver means coupled to both the two conductor communication channel and the signalling means, for synchronously receiving from the two conductor communication channel frames of digital bits, predetermined ones of which each contain data, voice and signalling information, and synchronously tansmitting frames of digital bits from the telephone to the predetermined destination via the two conductor communication channel;

voice digitizing means coupled to both the transceiver means and the signalling means, for converting the voice information portion of the received frames of digital bits to an analog output, and for receiving and converting an analog voice signal to a digital voice output which is coupled to the transceiver means for transmission;

asynchronous data inteface means coupled to the transceiver means, for receiving a receive portion of digital data from the transceiver means and providing the receive portion of data in asynchronous form at an output, and for asynchronously receiving a transmit portion of digital data and providing the transmit portion of data to the transceiver means while maintaining synchronization with the transceiver means;

switching power supply means having an input coupled to the two conductor communication channel, and an output, for converting D.C. power received from the two conductor communication channel to a regulated D.C. voltage for line powering the telephone set;

first isolation means coupled to the output of the switching power supply means, for converting D.C. power received from the communication channel to an isolated, regulated D.C. voltage for line powering the telephone set; and

second isolation means coupled between the transceiver

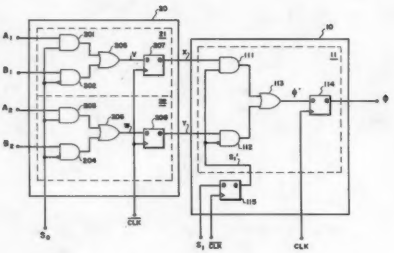
means and the two conductor communication channel, for electrically isolating D.C. voltage potentials which may be coupled to the communication channel at both the telephone set and a remote location.

4,593,390

PIPELINE MULTIPLEXER

David B. Hildebrand, Bedford, Tex., and David E. Karoly, Colorado Springs, Colo., assignors to Honeywell, Inc., Phoenix, Ariz.

Filed Aug. 9, 1984, Ser. No. 639,171
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—112 **1 Claim**



1. A pipelined multiplexer for selecting one-of-m initial input signals, comprising:

(a) n stages of select elements, where n is the stage number from 1 to N, the Nth stage being an input stage and the first stage being an output stage, each stage of said select elements including:

(b) $2^n/2$ select gate means, each select gate means having two input terminals adapted to receive an input signal and one output terminal, each select gate means for selecting one of two input signals from said input terminals to couple the selected input signal to said output terminal each select gate means of a predetermined stage of said select elements responsive to a select control signal, each output terminal of an ith stage of said select elements operatively connected to preselected input terminal of an i—1 stage of said select elements, where i is a whole number a value between N and 2 inclusive, the input terminals of said Nth stage of the select element each receiving one of the initial input signals, and the first stage of the select elements having a single output terminal thereby outputting the selected one-of-m initial input signals, each stage of said selected elements outputting their respective selected signals in response to a clocking signal, wherein each select gate means comprises:

(i) selection means, having two input terminals each adapted to receive one of said input signals, for selecting one of the input signals coupled to said input terminals in response to the respective select control signal; and

(ii) latch means, operatively connected to said selection means, for outputting the selected input signal in response to said clocking signal.

4,593,391

MACHINE CHECK PROCESSING SYSTEM

Yoshihiro Mizushima, Kawasaki, and Kazuyuki Shimizu, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 20, 1983, Ser. No. 563,654
Claims priority, application Japan, Dec. 29, 1982, 57-229290
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—15 **9 Claims**

1. A machine check processing system, comprising:

error correcting means for correcting a correctable error generated during data processing and identifying error data related to the correctable error;

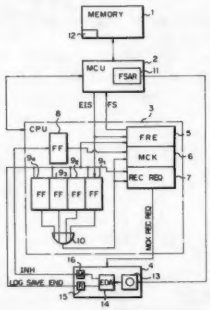
error data storing means, operatively connected to said error correcting means, for storing the error data realted to the correctable error;

a central processing unit, operatively connected to said error correcting means and said error data storing means, for controlling said error correcting means and said error data storing means, comprising:

error data freezing means, operatively connected to said error correcting means and said error data storing means, for freezing the error data stored in said error data storing means when the correctable error is corrected;

machine check record request signal generating means, operatively connected to said error correcting means, for generating a machine check record request signal when the correctable error is corrected; and

freeze release means, operatively connected to said error data freezing means, for subsequently releasing the error data; and



a service processing unit operatively connected to said machine check record request signal generating means, for operating and controlling said error correcting means, said error data storing means and said central processing unit, comprising:

error data saving means, operatively connected to said error data storing means and said machine check record request signal generating means, for carrying out a saving process to save the error data stored in said error data storing means in response to the machine check record request signal; and

error data analyzing means, operatively connected to said error data saving means, for carrying out an error analyzing process, said freeze release means releasing the error data stored in said error data storing means after said error data saving means saves the error data, at least a part of the saving process and the error analyzing process being carried out substantially simultaneously with the operating of said central processing unit.

4,593,392

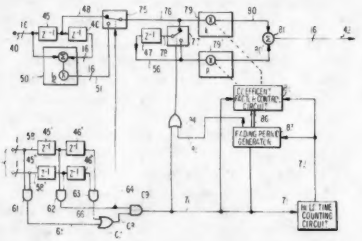
ERROR CORRECTION CIRCUIT FOR DIGITAL AUDIO SIGNAL

Toshitake Kouyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,708
Claims priority, application Japan, Aug. 27, 1982, 57-148986
Int. Cl.[4] H04N 5/76; G06F 11/00
U.S. Cl. 371—31 **9 Claims**

1. A digital signal error correction circuit of the type for receiving a digital audio signal, determining if an error exists in said digital audio signal and passing said digital audio signal to an error correction circuit output when no error is indicated

while providing an alternative signal to said error correction circuit output when an error is indicated, said error correction circuit further comprising:



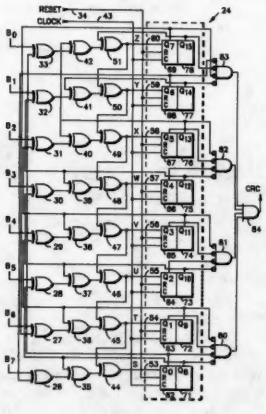
gain control means, responsive to a change in the provision of either said digital audio signal or said alternative signal to said error correction circuit output, for gradually increasing the gain of the newly provided signal at said error correction circuit output.

4,593,393

QUASI PARALLEL CYCLIC REDUNDANCY CHECKER

Barry B. Mead, Mesa, and Gerald V. Piosenka, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 6, 1984, Ser. No. 577,097
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **13 Claims**



1. A clocked cyclic redundancy checker (CRC) wherein less than a whole parallel input signal received by said CRC is converted by a single clock pulse, said CRC having a parallel input, a clock input and an output, comprising:

multiplexer means for selecting a portion of said parallel input signal received by said CRC to be converted, said multiplexer means having a parallel input coupled to said parallel input of said CRC, a clock input coupled to said clock input of said CRC, and a parallel output;

a plurality of first logic gates for converting the selected portion of said parallel input signal to a converted parallel input signal, said plurality of first logic gates having a first parallel input coupled to said parallel output of said multiplexer means, a second parallel input, and a parallel output;

register means for storing said converted parallel input signal, said register means having a parallel input, a parallel output and a clock input, said parallel input being coupled to said parallel output of said plurality of first logic gates, said clock input being coupled to said clock input of said CRC and said parallel output being coupled to said second parallel input of said plurality of first logic gates; and

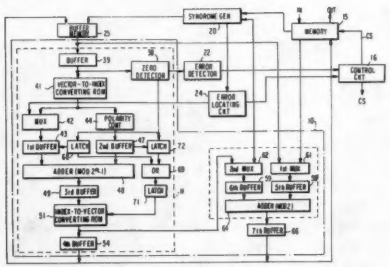
combining means for combining said converted parallel input signal to form a CRC signal, said combining means having a parallel input and an output, said parallel input being coupled to said parallel output of said register means and said output being coupled to said output of said CRC.

4,593,394

METHOD CAPABLE OF SIMULTANEOUSLY DECODING TWO REPRODUCED SEQUENCES

Yasuharu Tomimitsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,211
Claims priority, application Japan, Sep. 30, 1982, 57-171682
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—39 **6 Claims**



1. A method of decoding a sequence of interleaved codes into a sequence of output codes, said interleaved code sequence being divisible into a succession of frames and rearranged into a succession of blocks, each of said frames including a first sequence of a first data signal set, a first primary check signal set, and a first secondary check signal set while each of said blocks includes a second sequence of a second data signal set and a second primary check signal set which are produced by delaying said first data signal set and said first primary check signal set, respectively, said first and said second sequences being corrected by the use of said first secondary check signal set and said second primary check signal set, respectively, on occurrence of an error in each of said first and said second sequences, said method comprising the steps of:

successively and alternatingly diagnosing a syndrome of the error in connection with one of said first and said second sequences within a succession of first intervals and diagnosing a syndrome of the error in connection with the other of said first and second sequences within second intervals left between two adjacent ones of said first intervals; and

successively and alternatingly performing a calculation in a Galois field to correct the error in connection with the other of said first and said second sequences within said first intervals, and performing a calculation in a Galois field to correct the error in connection with the one of said first and second sequences within said second intervals.

4,593,395

ERROR CORRECTION METHOD FOR THE TRANSFER OF BLOCKS OF DATA BITS, A DEVICE AND PERFORMING SUCH A METHOD, A DECODER FOR USE WITH SUCH A METHOD, AND A DEVICE COMPRISING SUCH A DECODER

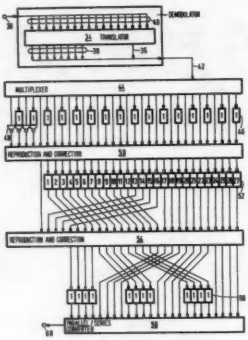
Kornelis A. Schouhamer Immink, and Lodewijk B. Vries, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 459,088, Jan. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 393,940, Jun. 30, 1982, Pat. No. 4,477,903. This application Jul. 25, 1985, Ser. No. 758,587

Claims priority, application Netherlands, Jan. 21, 1982, 8200207

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—40 **6 Claims**



1. An error correction device for the transfer of word-wise arranged data, comprising:

(a) means for receiving a succession of first numbers of data words in a first error encoder and adding to each first number of data words a first series of parity words on the basis of a first generator matrix of a first word correction code;

(b) means for interleaving said first numbers of data words and first series of parity words by means of respective delay times which are all different within each first number and associated first series in order to form a succession of second numbers of words, each second number of words having a number of data words equal to said first number plus a number of check words equal to the number in a first series;

(c) means for receiving a second number of words of said succession in a second error encoder and adding to said second number of words a second series of parity words on the basis of a second generator matrix of a second word correction code so as to form a third number of words;

(d) means for word-by-word modulation of said third numbers of words serially linked in order to form channel words for transfer, which satisfy, by way of added redundancy, predetermined upper limits and lower limits for the admissible intervals between directly successive signal transitions, said channel words being serially concatenated and pair-wise separated by merging bits which in combination with the channel words also satisfy said upper and lower limits;

(e) means for demodulation of the channel words and merging bits after the transfer in order to reconstruct said third number of words (**34**);

(f) means for receiving said third numbers of words, and from each third number reproducing, and if possible and necessary, correcting said second numbers of words (**50**), on the basis of the second parity check matrix associated with the second generator matrix;

(g) means for de-interleaving (**52**) said second numbers of words, followed by the reproducing therefrom, and if possible and necessary, correcting said first numbers of data words for a user (**54**) on the basis of the first parity check matrix associated with the first generator matrix;

characterized in that said device further includes:

means for adding a first flag bit during demodulation to the word of said third number of words which is formed from an unrecognizable channel word, a second flag bit being added (**114**) to each word of the relevant second number of words during the reproduction of a said second number of words on the basis of the second parity check matrix under the control of an excessive number of first flag bits (**116**) within a said third number, in order to indicate the relevant second number of words as being generally unreliable;

said second word correction code is a systematic code;

during the reproduction of said second number of words on the basis of the second parity check matrix use is made of a number of first flag bits which lies between further predetermined limits in order to act as further error locators for a correction to be executed.

4,593,396

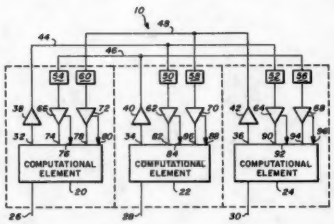
PROCESS FOR A FAULT-TOLERANT DATA PROCESSING SYSTEM WITH ERROR DETECTION AND RESISTANCE TO FAULT PROPAGATION

Robert L. Anderson, Jr., Salem, Oreg., assignor to August Systems, Tigard, Oreg.

Filed Oct. 8, 1982, Ser. No. 433,501

Int. Cl.[4] G06F *11/08*

U.S. Cl. 371—68 **15 Claims**



1. In a multiple computational element fault-tolerant computer system for receiving data from a plurality of input devices where data provided to said computational elements from said input devices may differ without being incorrect, a process for attaining agreement in an input data set utilized by each of a plurality of said computational elements, the process comprising the steps of:

a. applying one of a plurality of "n" input signals to a plurality of "n" computational elements with each said computational element storing a value therein corresponding to its respective input signal, said value thereby becoming said computational elements "personal value" of the input signals;

b. each of said computational elements transmitting its "personal value" to each other of said computational elements by means of an encoding transmitter associated with each of said computational elements and each of said computational elements receiving a respective "personal value" from each other said computational elements by means of at least one of a plurality of decoding receivers where at least one said receiver is associated with each of said receiving computational elements, wherein each transmission between said transmitters and said receivers comprises one said computational element's "personal value,"

and a redundancy component, and wherein any discrepancy between said "personal value" and said redundancy component causes a decoding receiver to send an error message to a computational element associated with said decoding receiver;

c. each computational element transmitting said "personal value" data received from each other of said computational elements by means of at least one encoding transmitter and at least one decoding receiver wherein each transmission so transmitted comprises the "personal value" previously received from at least one other of said computational elements, and a current redundancy component, and wherein any discrepancy between said "personal value" and said current redundancy component causes said receiver to send an error message to one of said computational elements;

d. each of said computational elements accepting a first value received originating from each other of said computational elements which is not accompanied by an error message as representing the "personal value" of a computational element which first transmitted said value, and each said computational element substituting a default value for the "personal value" of any of said computational elements for which that receiving computational element does not receive a value unaccompanied by an error message; and

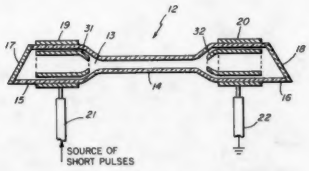
e. each of said computational elements utilizing a collection of "n" "personal values" for the "n" computational elements as a data base for a program from which an output value of each said computational element is formed.

4,593,397

ELECTRODELESS SHORT PULSE LASER

Joseph M. Proud, Wellesley Hills; Donald H. Baird, Newton; Jerry M. Kramer, Acton, all of Mass., and Joseph E. Lester, Gibsonia, Pa., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 15, 1979, Ser. No. 20,576
Int. Cl.⁴ H01S 3/097
U.S. Cl. 372—82 **3 Claims**



1. In a system for the generation of coherent beams of radiation, a combination comprising

a tube defining a resonant cavity containing a discharge plasma capable of producing coherent radiation, said tube having an elongated shape along an optical axis along the longitudinal axis of said tube, said tube having end portions and an elongated constricted portion connecting said end portions, and said tube having laser windows sealing said end portions to form a closed envelope containing said discharge plasma,

a mirror on said optical axis near at least one end of said tube,

first and second external electrode means on the outside surfaces of said tube adjacent the opposite ends of said tube, said external electrode means being capacitively coupled to said discharge plasma, and

means for providing a source of short pulses electrically to said first external electrode means and means for coupling said second external electrode means to a point of reference potential,

further characterized by first and second internal electrode means respectively adjacent said first and second external electrode means and capacitively coupled thereto,

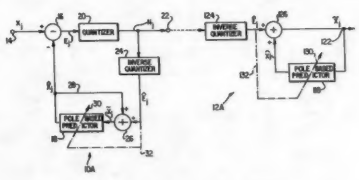
said tube having end portions sealed to form a closed envelope containing said discharge plasma and said internal electrode means.

4,593,398

ADAPTIVE DIFFERENTIAL PCM SYSTEM WITH RESIDUAL-DRIVEN ADAPTATION OF FEEDBACK PREDICTOR

Douglas J. Millar, Verdun, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 28, 1983, Ser. No. 546,738
Claims priority, application Canada, Jul. 18, 1983, 432615
Int. Cl.⁴ H03M 7/38
U.S. Cl. 375—27 **60 Claims**



22. A transmitter for an adaptive differential pulse code modulation system including; a subtractor for deriving the difference E_j between an input signal X_j and a predicted value $\tilde{X}_j$, a quantizer for quantizing the difference signal E_j from said subtractor to obtain a numeric representation N_j thereof;

an inverse quantizer for recovering the difference signal $\hat{E}_j$ from said numeric representation N_j;

summing means for summing the difference signal $\hat{E}_j$ and the predicted value $\tilde{X}_j$ to provide a reconstructed signal $\hat{X}_j$;

predictor means having variable prediction coefficients for receiving the reconstructed signal $\hat{X}_j$ from said summing means and generating therefrom a predictor output signal $\tilde{X}_{jp}$ comprising at least partially said predicted value $\tilde{X}_j$; and

a feedback loop for applying said predicted value to said summing means;

said predictor means being arranged to derived each prediction coefficient using an equation consisting essentially of a decay term and a non-linear function having at least one set of arguments comprising a finite number of past values of said difference signal $\hat{E}_j$ and having no arguments comprising the value of said reconstructed signal $\hat{X}_j$.

42. A receiver for an adaptive differential pulse code modulation system comprising an inverse quantizer for recovering a receiver quantized difference signal $\hat{E}_j$ from a received numeric representation N_j;

an adder for combining a receiver predicted value $\tilde{X}_j$ and a receiver quantized difference signal $\hat{E}_j$ to provide a reconstructed signal $\hat{X}_j$;

receiver predictor means having variable prediction coefficients, for receiving said reconstructed signal and providing therefrom a predictor output comprising at least partially said receiver predicted value;

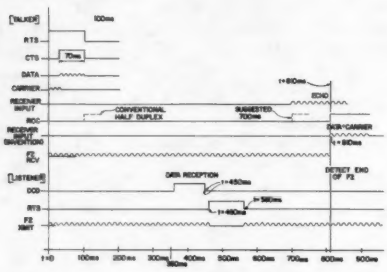
said predictor means being arranged to derive each predictor coefficient using an equation consisting essentially of a decay term and a non-linear function having at least one set of arguments comprising a finite number of past values of said difference signal $\hat{E}_j$ and having no arguments comprising the value of said reconstructed signal $\hat{X}_j$.

4,593,399

METHOD AND APPARATUS FOR MAXIMIZING EFFICIENCY IN SATELLITE COMMUNICATIONS

Charles R. Baugh; Edwin J. Hilpert, both of Plantation, Fla.; George R. Kushin, Newport, R.I.; Yoon B. Park, North Boro, Mass., and William A. Dambrackas, Fla. assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed May 9, 1983, Ser. No. 493,144
Int. Cl.[4] H04S *15/00*
U.S. Cl. 375—104 **8 Claims**



1. A method of eliminating echo interference in half-duplex data transmission between a first local modem and a second remote modem separated by a variable tranmission delay interval over telephone line and satellite facilities between said remote/local modem, said local modem including means responsive to a signal for squelching its receiver, said method comprising the steps of:

sending a tone from the remote modem to the local modem during the absence of data transmission to the local modem, said tone being at a frequency which is detectable by the local modem despite the presence on the channel of the data signal;

terminating said tone substantially at the beginning of data transmission from said remote modem to said local modem;

detecting, at said local modem, the termination of said tone; and

removing said signal from said means for squelching in response to detection of said termination, thereby enabling the receiver of said local modem to receive data.

4,593,400

APPARATUS FOR PROVIDING A DENTAL RADIOLOGICAL IMAGE AND INTRA-ORAL SENSOR USED THEREWITH

Francis Mouyen, 12, Avenue d'Occitanie, 31520 Ramoville-Saint-Agne, France

Filed Jun. 15, 1984, Ser. No. 621,237
Claims priority, application France, Jun. 16, 1983, 83 10277
Int. Cl.[4] A61B *6/14*
U.S. Cl. 378—99 **16 Claims**

1. An apparatus for providing a dental radiological image on the monitor of a display system, said apparatus comprising:

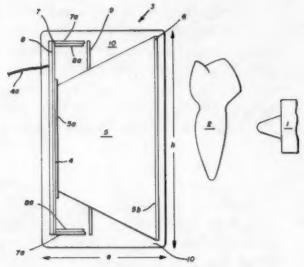
an extraoral X-ray source;

an intraoral sensor for the X-rays passing through a radiated tooth, said sensor being coaxial to the X-ray beam emerging from said tooth; and

an extraoral electronic data processing unit connected to said sensor,

said sensor comprising a charge coupled device and a screen, said screen being located between the charge-coupled device and the radiated tooth, and being provided on entry with a scintillator which converts the X-rays which have passed through the tooth into visible radiation, said screen being made of a layer of translucid material permeable to visible radiation, and translucid material being loaded with particles intended for preventing the passage of X-rays passing through said scintillator and which have not been converted into visible radiation by the scintillator,

each elemental part of the various constituents of the optical system constituted of said scintillator, said screen, and said charge-coupled device organized according to the transmission of the dental image, having a diameter progressively increased for an optimization of the capacity of



resolution of picture elements in the charge-coupled device, and of the reduction of the double moiré effect;

said screen comprising reducing optical fibers loaded with metallic oxide particles intended to absorb the X-ray energy which has not been converted by said scintillator; and

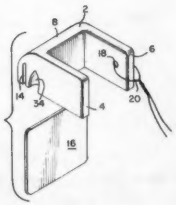
said intraoral sensor comprising a microelectronic means for monitoring the charge-coupled device and for amplifying the output signal of the charge-coupled device.

4,593,401

ENDODONTIC FILM HOLDER

James J. Colbert, 5106 W. 47th St., Sioux Falls, S. Dak. 57106

Filed Mar. 29, 1984, Ser. No. 594,922
Int. Cl.[4] A61B *6/14*; G03B *42/04*
U.S. Cl. 378—168 **7 Claims**



1. A radiographic film holder, comprising a one-piece, three-sided, box-shaped member means for placement over a tooth and for resting on said tooth so as to surround an endodontic file which is present in said tooth, and further having a slot therein into which radiographic film is inserted parallel to the direction of growth of said tooth.

4,593,402

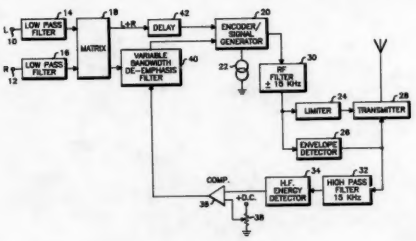
AM STEREO TRANSMITTER

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 21, 1984, Ser. No. 653,649
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—16 **4 Claims**

1. A transmitter for transmitting a compatible AM stereophonic signal and comprising:

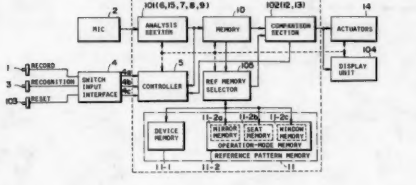
input means for providing two information signals;
matrixing means coupled to the input means for providing sum and difference output signals from the two information signals;
carrier signal generator means for providing a carrier frequency signal;
encoder means coupled to receive the matrixing means output signals and the carrier frequency signal and for amplitude modulating the carrier signal in quadrature with the sum and difference signals;
first bandpass filter means coupled to the output of the encoder means for removing out-of-channel sidebands from the encoded carrier signal;
first detector means coupled to the first filter means for detecting the amplitude of at least one component of the encoded and filtered signal;
second high pass filter means coupled to filter the output signals of the first detector means;
second detector means coupled to detect the level of energy in the second filter means output signal;
third filter means coupled to control the level of the difference signal coupled to the encoder means in response to the second detector means output signals.



4,593,403
SPEECH RECOGNITION SYSTEM AND METHOD FOR AN AUTOMOTIVE VEHICLE

Norimasa Kishi, and Kazunori Noso, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 29, 1982, Ser. No. 428,232
Claims priority, application Japan, Oct. 22, 1981, 56-167949
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—43 **8 Claims**

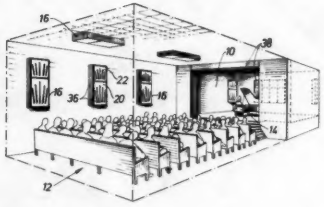


1. A speech recognition system for an automotive vehicle for sequentially actuating a device having a plurality of different operating modes by a plurality of actuators in accordance with a plurality of spoken instructions coupled through a microphone, which comprises:
(a) recognizing means for separately recognizing a spoken instruction corresponding to (1) the device and (2) plural operating modes for the device and for deriving signals to actuate the corresponding actuators;
(b) first memory means for storing a reference spoken instruction signal corresponding to the device;
(c) a plurality of second memory means for storing reference spoken instruction signals corresponding to a plurality of operation-modes for the device;
(d) resetting means connected to said recognizing means for deriving a reset signal; and
(e) selecting means for connecting said recognizing means to said first memory to recognize the device instruction phrase and then sequentially to one of said second memory means to recognize the operation-mode instruction phrases and to actuate an actuator corresponding to the recognized operation-mode instruction phrases, the recognized spoken instruction phrase being cancelled in response to the reset signal, and the actuated actuator being stopped and the operation-mode being renewed in response to the reset signal, whereby the actuator corresponding to the recognized operation-mode instruction phrases can be actuated without uttering the same device spoken instruction repeatedly.

4,593,404
METHOD OF IMPROVING THE ACOUSTICS OF A HALL

Gustav G. Bolin, Renstierras Gata 12, Stockholm, Sweden

Continuation of Ser. No. 456,126, Jan. 6, 1983, abandoned, which is a continuation of Ser. No. 196,706, Oct. 14, 1980, abandoned. This application Jul. 17, 1984, Ser. No. 632,252
Claims priority, application Sweden, Oct. 16, 1979, 7908568
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—82 **5 Claims**



1. A method of improving the acoustics of a room having a performance area in which sound is generated from a sound source and an audience listening area which is spaced from the performance area and which is defined by wall and ceiling elements, utilizing first soundboard means, the first soundboard being of a box shape configuration having a substantially planar wooden outer surface element which is mounted to a frame, the soundboard being open on the side opposite the wooden outer surface, the wooden surface element being no greater than 10 mms. in thickness so that the wooden outer surfaces element will vibrate in response to sound waves traveling through the air thereby the first soundboard will reflect sound waves traveling through the air toward the first soundboard means, and electromagnetic means mounted within the first soundboard means so as to vibrate the outer surface element thereof so that the first soundboard means generates sound waves induced by the electromagnetic means connected thereto comprising the steps of:
(a) mounting at least one of the first soundboard means to at least one of the wall or ceiling elements so as to overlay a portion of the wall or ceiling elements within the audience listening area and remote from the sound source so that the outer surface element is oriented toward the audience listening area and away from the one wall or ceiling element;
(b) positioning microphone means within the performance area to receive sound waves eminating from the sound source;

(c) electrically connecting said microphone means to the electromagnetic means of the first soundboard means so that the electromagnetic means of the first soundboard means receives electrical impulses transmitted from said microphone means; and

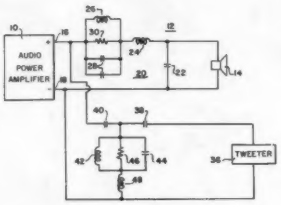
(d) amplifying the electric impulses transmitted from the microphone means to the electromagnetic means of the first soundboard means so that the first soundboard means is acted upon by vibrations generated by the electromagnetic means from electrical impulses received from said microphone means from the sound source while simultaneously being vibrated by sound waves received directly through the air from the sound source whereby the sound waves emitted from the first soundboard means is a combination of reflected and electrically generated sound waves.

4,593,405

LOUDSPEAKER SYSTEM WITH COMBINATION CROSSOVER AND EQUALIZER

Kent Frye, Buchanan, Mich., and Gary T. Ewald, South Bend, Ind., assignors to Electro-Voice, Incorporated, Buchanan, Mich.

Filed May 24, 1984, Ser. No. 613,566
Int. Cl.[4] H03G *5/00*
U.S. Cl. 381—99 **9 Claims**



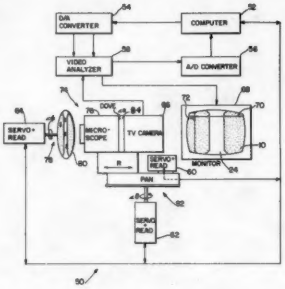
1. A multiple loudspeaker system for reproducing audio signals over a frequency response range comprising a first input terminal and a second input terminal, a first electromagnetic loudspeaker adapted to produce sounds in the portion of the audible range below a transition frequency having two inputs electrically connected to the first and second input terminals, a second electromagnetic loudspeaker adapted to produce sounds in the portion of the audible range above said transition frequency and having two inputs, said second loudspeaker having a mechanical resonance at a frequency approximately equal to the transition frequency, and a coupling network electrically connected between the first and second input terminals and the inputs of the second loudspeaker characterized in that the coupling network includes a resonant circuit and a filter, the filter having a low impedance coupled across the second loudspeaker for frequencies below the frequency of mechanical resonance of the second loudspeaker and a high impedance above the frequency of mechanical resonance of the second loudspeaker, and the resonant circuit being coupled across the inputs of the second loudspeaker and having a high impedance at resonance, said resonant circuit being electrically resonant at a frequency in the sound range of the second loudspeaker above the frequency of the mechanical resonance of the second loudspeaker.

4,593,406

AUTOMATIC IMAGE ACQUISITION PROCESSOR AND METHOD

William J. Stone, Kansas City, Mo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1984, Ser. No. 571,297
Int. Cl.[4] G06K *9/32*
U.S. Cl. 382—44 **17 Claims**



1. An automatic method for determining the geometric center of an element having a known peripheral shape of double symmetry comprising:

selecting a trial center of an image of said element and defining a plurality of sectors radiating from said trial center and ecompassing all of at least a preselected portion of said element image;

determining which ones of a locus of points overlie said image, said locus of points consisting of a number of spaced points along a line running through all of said sectors and having a predetermined relationship to said trial center;

comparing the number of points that overlie said image in each sector with the number of points overlying said image in each of the other sectors;

ascertaining whether said comparison is the same as a predefined comparison that exists when the trial center is the geometric center of said element; and

if said comparison does not equal said predefined comparison, relatively moving said trial center with respect to said geometric center and repeating said selecting, determining, comparing and ascertaining steps.

4,593,407

PATTERN PROCESSING SYSTEM

Akira Konishi, Fujisawa, and Shigeru Matsuura, Chigasaki, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,271
Claims priority, application Japan, Sep. 30, 1983, 58-180856
Int. Cl.[4] G06K *9/32*
U.S. Cl. 382—46 **1 Claim**

1. A pattern processing system comprising:

a pattern storage for storing plural dot matrix patterns representing various characters, etc., each pattern comprising plural squares each of which consists of n×n bits (n is integer larger than 1);

a read-out means for successively reading out plural squares of any one of patterns from said pattern storage;

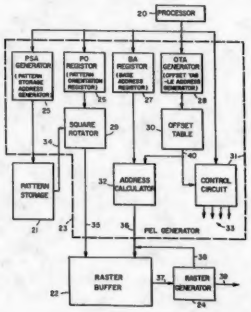
a register for storing control information indicating one of plural predetermined rotation angles for the pattern read out from said pattern storage;

a rotation means for receiving parallel n×n bits of each square read out by said read-out means via plural input lines and for gating said parallel n×n bits onto plural

output lines in a fashion which is changed according to the control information in said register, thereby rotating each square by the indicated angle;

a raster buffer having plural addressable storage locations each of which comprises n×n bit positions for receiving and storing the n×n bits of each square from the output lines of said rotation means;

an address means associated with said raster buffer for designating any one of storage locations to receive each square



from the output lines of said rotation means, said address means including means for holding a base address to indicate a basic one of plural storage locations which are to store plural squares of one pattern and means for successively generating offsets to indicate displacements from said base address for plural storage locations to receive said plural squares locations are designated by the combination of said base address and said offsets; and

a control means for controlling said read-out means, register and address means.

4,593,408

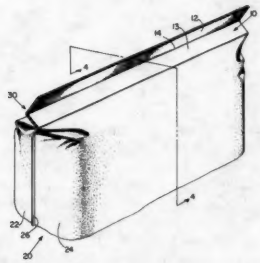
EASY OPEN/RECLOSE DEVICE FOR FLEXIBLE PACKAGES

James L. Drobish, Wyoming, and Gary E. McKibben, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 26, 1984, Ser. No. 664,918

Int. Cl.[4] B65D *33/30*

U.S. Cl. 383—43 **18 Claims**



1. A closure device for a flexible package having an opening, said closure device comprising a substantially concavo-convex closure strip mounted at said opening with its convex face oriented toward the interior of said package and being resiliently flexible between a stable undeflected position, wherein said opening is maintained in a closed condition, and a stable deflected position, wherein said opening is maintained in a substantially opened condition, said closure strip comprising two non-parallel intersecting surfaces which are joined longitudinally along their intersection by a curved fillet-like section having a predetermined radius r, said intersecting surfaces each having a minimum width greater than or equal to a predetermined width w, and said intersecting surfaces being disposed relative to one another at a predetermined angle α as measured between the adjacent faces of said intersecting surfaces, wherein angle α is greater than 0° and less than 180° and the value of r/w^2 is greater than or equal to 0 mm^{-1} and less than or equal to approximately 0.04 mm^{-1} when the values r and w are measured in millimeter units.

4,593,409

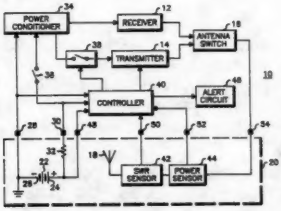
TRANSCEIVER PROTECTION ARRANGEMENT

Jerry A. Miller, Tamarac, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1984, Ser. No. 596,748

Int. Cl.[4] H04B *1/40, 1/04, 17/00*

U.S. Cl. 455—73 **30 Claims**



22. A method of protecting a transmitter against an unsuitable antenna, comprising the steps of:

reading an antenna code associated with an antenna;

comparing in the transmitter said antenna code with a code stored within said transmitter to determine if said antenna is appropriate for said transmitter; and

generating a predetermined signal indicative of an improper antenna if said antenna code and said stored code do not match.

4,593,410

SINGLE-SIDEBAND TRANSMITTER AND METHOD FOR OPERATING THIS TRANSMITTER

Bohumil Kyrian, Unterbözberg, Switzerland, assignor to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed Dec. 20, 1983, Ser. No. 563,506

Claims priority, application European Pat. Off., Dec. 28, 1982, 82201663.0

Int. Cl.[4] H04B *1/68;* H03C *1/52*

U.S. Cl. 455—109 **1 Claim**

1. A single-sideband transmitter having a phase-modulation path and an amplitude modulation path, comprising:

a single-sideband generator;

a radio-frequency amplifier connected to said single-sideband generator via said amplitude-modulation path and said phase-modulation path;

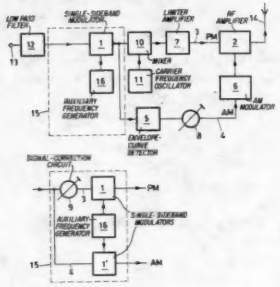
a limiter amplifier provided in said phase-modulation path;

said amplitude-modulation path comprising an envelope-curve detector having an input coupled to said single-sideband generator and an output, a phase-correction circuit coupled to said output for correcting the phase of said detector output, and an amplitude-modulator connected in series with said phase-correction circuit, whereby the amplitude-modulation path is dc voltage coupled from the output of the envelope-curve detector to the radio-frequency amplifier;

said amplitude modulator comprising a switch amplifier having plural controllable switching stages, said switching stages making possible a progressive increase and decrease of an output voltage of the switch amplifier; and

wherein the single-sideband generator comprises,

a pair of single-sideband modulators each coupled to a respective modulation path, and



a single correction circuit disposed in front of the single-sideband modulator of the phase modulation path, said single-correction circuit simulating the transmission characteristic of the amplitude modulator.

4,593,411

DIODE MIXER WITH BIAS CONTROL

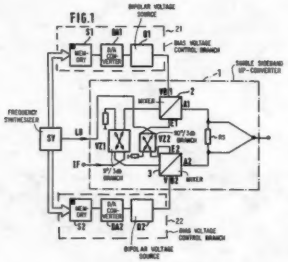
Wolfgang Schiller, Bismarckstrasse 22, D-7100 Heilbronn, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,001

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309399

Int. Cl.[4] H04B *1/16, 1/26*

U.S. Cl. 455—109 **5 Claims**



1. A diode mixer arrangement comprising:

a mixer stage connected for receiving a signal having a frequency to be converted and an oscillator signal having one of a plurality of preselectable oscillator frequencies, said mixer stage including diodes arranged to be biased by a predetermined direct control voltage for the compensation of parasitic influences: and

bias voltage means connected to said mixer stage for producing the predetermined direct control voltage, said bias voltage means including a memory means for storing a plurality of data signals each of which represents a predetermined direct control voltage corresponding to a respective one of the plurality of preselectable oscillator frequencies, said memory means having an input for receiving an input signal which represents the preselectable oscillator frequency of the oscillator signal received by said mixer stage and output means for reading out the corresponding data signal, wherein said bias voltage means uses such corresponding data signal to generate the predetermined direct control voltage.

4,593,412

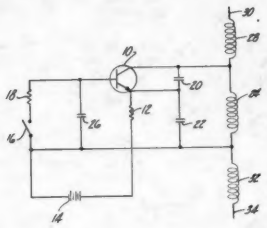
INTEGRATED OSCILLATOR ANTENNA FOR LOW POWER, LOW HARMONIC RADIATION

Keith Jacob, Ann Arbor, Mich., assignor to Multi-Elmac Company, Novi, Mich.

Filed May 21, 1984, Ser. No. 612,393

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—129 **2 Claims**



1. In a radio transmitter of the type which includes an oscillator having a tank circuit and an inductor in the tank circuit serving as an antenna element and having first and second ends, first and second antenna inductors each having first and second ends with the first ends of the first and second antenna inductors respectively coupled to the first and second ends of the tank circuit inductor, the second ends of the first and second antenna inductors being connected to a respective antenna conductor with an open terminal end forming a center-fed dipole antenna.

4,593,413

SPACE-DIVERSITY RECEIVING SYSTEM

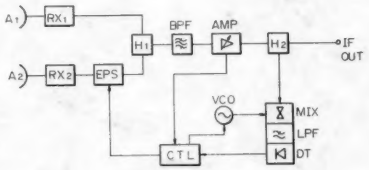
Takayuki Ozaki, Tochigi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 617,581, Jun. 5, 1984, abandoned. This application Sep. 26, 1985, Ser. No. 780,244

Claims priority, application Japan, Jun. 13, 1983, 58-105486

Int. Cl.[4] H04B *7/08*

U.S. Cl. 455—139 **18 Claims**



17. An apparatus for a space-diversity receiving system which receives microwaves, each of the microwaves corresponding to a single transmit signal transmitted from a remote transmitting station, said system comprising:

signal processing means, operatively connected to receive the microwaves, for phase shifting at least one of the microwaves to produce a processed signal, for combining the processed signal with any of the other microwaves to produce a combined signal and for splitting the combined signal into a main output and sub-output;

generating means for generating a reference frequency signal;

deviation detection means, operatively connected to said signal processing means and said generating means, for mixing the sub-output and the reference frequency signal to produce a mixed signal and for detecting the mixed signal to produce a detected signal; and

controlling means, operatively connected to said signal processing means, said generating means and said devia-

tion detection means, for controlling the phase shifting of the at least one of the microwaves by said signal processing means and the frequency of the reference signal generated by said generating means in dependence upon the detected signal.

4,593,414

PROGRAMABLE CHANNEL SELECTING SYSTEM

Yukio Koyanagi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00120, § 371 Date Dec. 14, 1983, § 102(e) Date Dec. 14, 1983, PCT Pub. No. WO83/03726, PCT Pub. Date Oct. 27, 1983

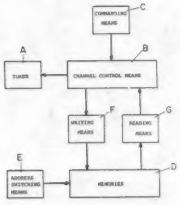
PCT Filed Apr. 15, 1983, Ser. No. 568,240

Claims priority, application Japan, Apr. 19, 1982, 57-65897

Int. Cl.[4] H04B *1/16*

U.S. Cl. 455—186 **2 Claims**

1. A programmable channel selecting system comprising a tuner for selecting the channel to be received, a channel control means for producing control signals which are input to said tuner so as to control the channel selection thereof, a manually operated commanding means for manually switching the channel received by said tuner and for entering channel data into said channel control means which represent the channels to be selected, memories for storing said channel data, an address switching means for specifying write/read addresses in said memories which are switched at definite time intervals and for effecting address designations at a predetermined time period of a timing cycle, a writing means for writing into and storing as program data in the addresses specified at switching times in said memories said channel data which have been entered by said commanding means at manual switching times and which represent said channels selected by said tuner, and a reading means for reading out from said memories said program data at read times, which are set at predetermined time intevals and, then, entering said channel data into said channel controlling means in accordance with said program data, thereby automatically switching said channel as selected by said tuner on the basis of said program data,



wherein said writing means is adapted to write channel data which has been selected during a last predetermined time period after the time when said channel to be selected is switched but before a next time period following said last predetermined time period when said channel to be selected next is switched, said channel data being written into an address of said memories from which said data is to be read out by said reading means at the read time.

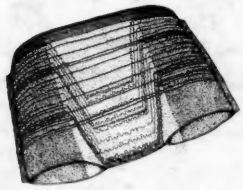
DESIGN PATENTS

GRANTED JUN. 3, 1986

ERRATA

For CLASS	See PATENT NO.
D15–028	284,116
D05–053	284,131

284,036
DIAPER PANTS
Mats G. Birring, Göteborg, Sweden, assignor to Molnlycke Aktiebolag, Goteborg, Sweden
Filed Mar. 1, 1983, Ser. No. 471,213
Term of patent 14 years
U.S. Cl. D2—10



284,037
BRASSIERE
Flavia DiTullio, New York, N.Y., assignor to Bali Company, Winston-Salem, N.C.
Filed Oct. 13, 1983, Ser. No. 541,792
Term of patent 14 years
U.S. Cl. D2—24

284,038
SHIN GUARD
Lars Eghamn, PL 2392, S-864 00 Matfors, and Arne Soderberg, Tallnasvagen 53 A, S-861 00 Timra, both of Sweden
Filed Jan. 4, 1984, Ser. No. 568,249
Claims priority, application Sweden, Aug. 31, 1983, 83-2221
Term of patent 14 years
U.S. Cl. D2—27

284,039
SPORTS SHOE
Rinichi Yoshitake, Tosu, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Feb. 21, 1984, Ser. No. 581,650
Claims priority, application Japan, Aug. 24, 1983, 58-37280
Term of patent 14 years
U.S. Cl. D2—310

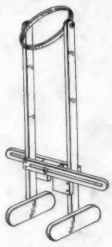
284,040
SPORTS SHOE
Rinichi Yoshitake, Tosu, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Apr. 2, 1984, Ser. No. 595,799
Claims priority, application Japan, Oct. 3, 1983, 58-43101
Term of patent 14 years
U.S. Cl. D2—310

284,041
SPORTS SHOE
Rinichi Yoshitake, Tosu, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Apr. 20, 1984, Ser. No. 602,565
Claims priority, application Japan, Oct. 20, 1983, 58-45700
Term of patent 14 years
U.S. Cl. D2—310

284,042
TIE CLASP
Frank Vitello, 1606 Miles St., and Richard D. Snider, 422 1/2 First St., both of Logansport, Ind. 46947
Filed Dec. 6, 1983, Ser. No. 558,613
Term of patent 14 years
U.S. Cl. D2—448

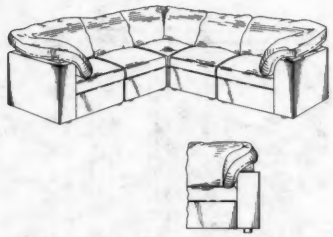
284,043
SHOE
Ralph L. Lowe, Jr., and Patrick S. Elliott, both of Pearland, Tex., assignors to Aspri Sports, Inc., Pearland, Tex.
Filed Apr. 17, 1984, Ser. No. 601,238
Term of patent 14 years
U.S. Cl. D2—310

284,044
EMBROIDERY HOOP HOLDER
James D. Di Martino, 14099 Mortenview, Taylor, Mich. 48180
Filed Mar. 9, 1984, Ser. No. 588,154
Term of patent 14 years
U.S. Cl. D3—26



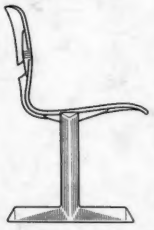
284,045
COMBINED MANICURING FILE AND BRUSH
Cerafine A. Thomas, 7547 S. Paulina, Chicago, Ill. 60620, and Lynne D. Lewis, 4315 Prairie Ave., Chicago, Ill. 60653
Filed Sep. 19, 1984, Ser. No. 652,195
Term of patent 14 years
U.S. Cl. D4—116

284,046
SECTIONAL SOFA
Thomas A. Staats; Robert A. Smitherman, and William E. Hoover, all of Salisbury, N.C., assignors to Carter Industries, Inc., Salisbury, N.C.
Continuation-in-part of Ser. No. 547,101, Oct. 31, 1983. This application Aug. 5, 1985, Ser. No. 762,524
Term of patent 14 years
U.S. Cl. D6—335

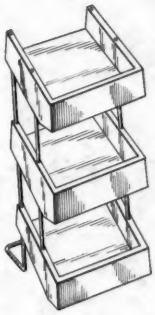


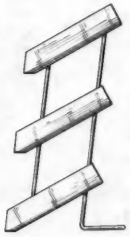
284,047
LEGREST ATTACHMENT FOR A CHAIR
Kenneth J. Striebel, Kokomo, Ind., assignor to Joseph's Inc., Frankfort, Ind.
Filed Nov. 16, 1983, Ser. No. 552,260
Term of patent 14 years
U.S. Cl. D6—353

284,048
CHAIR
Emilio Ambasz, New York, N.Y., and Giancarlo Piretti, Bologna, Italy, assignors to Center for Design Research and Development N.V., Netherlands Antilles
Filed Apr. 15, 1983, Ser. No. 485,268
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, URA1193/82
Term of patent 14 years
U.S. Cl. D6—380



284,049
MODULAR DISPLAY RACK
Walter Nathan, Glencoe, and Armand S. Zucker, Skokie, both of Ill., assignors to RTC Industries, Inc., Chicago, Ill.
Filed Jan. 27, 1984, Ser. No. 574,405
Term of patent 14 years
U.S. Cl. D6—408





284,050

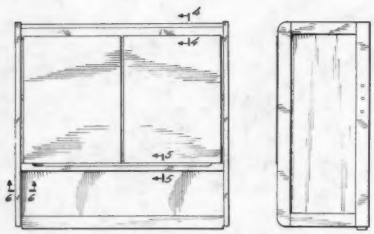
DOOR HUTCH

Merlin A. Brunner; David W. Robinson, both of New London, and Harvey J. Draheim, Weyauwega, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,798

Term of patent 14 years

U.S. Cl. D6—432



284,051

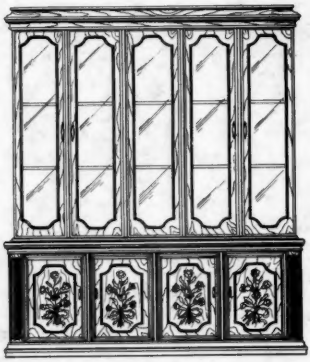
BREAKFRONT OR THE LIKE

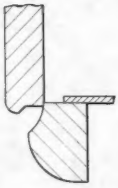
Joseph E. Adkinson, deceased, late of Chevy Chase, Md., by Mary K. Adkinson, executrix, 3807 Leland St., Chevy Chase, Md. 20815

Continuation-in-part of Ser. No. 298,202, Aug. 31, 1981, abandoned. This application Feb. 19, 1985, Ser. No. 702,430

Term of patent 14 years

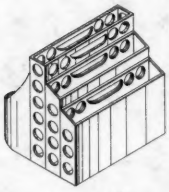
U.S. Cl. D6—438

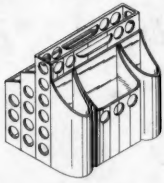




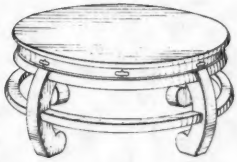
284,052
DISPLAY RACK
Douglas P. Blunden, 18595 N. Oak Ct., Mount Clemens, Mich. 48044
Filed Sep. 1, 1983, Ser. No. 528,637
Term of patent 14 years
U.S. Cl. D6—457

284,053
HOLDER FOR MULTIPLE READING MATERIAL
Victor M. Chinchar, Two King James South, 24650 Center Ridge Rd., Westlake, Ohio 44145
Filed Feb. 22, 1984, Ser. No. 582,270
Term of patent 14 years
U.S. Cl. D6—469

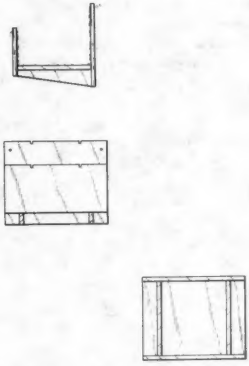




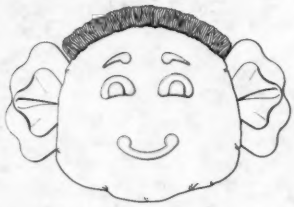
284,054
TABLE
Christopher S. Bergelin, Morganton, N.C., assignor to Gordon's Inc., Johnson City, Tenn.
Filed Sep. 20, 1985, Ser. No. 778,138
The portion of the term of this patent subsequent to May 20, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—484



284,055
COMBINED PAPER STACKER AND BALER
Glenn H. Barfell, 7404 Rumsey Rd., Oklahoma City, Okla. 73132
Filed Jul. 26, 1983, Ser. No. 517,778
Term of patent 14 years
U.S. Cl. D6—567

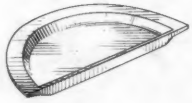


284,056
PILLOW
Ardyce V. Kinsley, 5719 Cannon La., Alexandria, Va. 22303
Filed Jun. 19, 1984, Ser. No. 622,162
Term of patent 14 years
U.S. Cl. D6—601

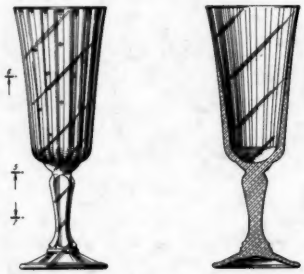


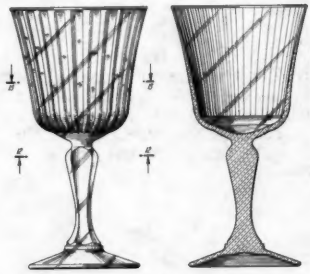
284,057
BABY CAR SEAT BAG
Cheryl A. Wise, 4644 Rathburn Dr., Englewood, Ohio 45322
Filed Mar. 31, 1982, Ser. No. 363,803
Term of patent 14 years
U.S. Cl. D6—611

284,058
DIETER'S DISH
Richard Kahn, 17 Diamond Dr., Plainview, N.Y. 11803, and David E. Feigin, 34 Clay St., Fair Haven, N.J. 07701
Filed Feb. 22, 1984, Ser. No. 582,548
Term of patent 14 years
U.S. Cl. D7—1

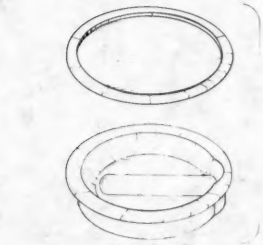


284,059
GOBLET OR SIMILAR ARTICLE
Jean-Jacques Durand, LaButte, 62510 Arques, France
Filed Nov. 1, 1983, Ser. No. 547,726
Term of patent 14 years
U.S. Cl. D7—13

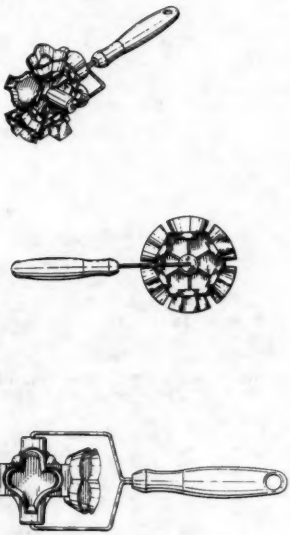




284,060
COVERED GERIATRIC'S DISH
Kenneth H. Adams, 15 Victorious St., Salisbury Heights, Australia
Filed May 18, 1983, Ser. No. 495,880
Claims priority, application Australia, Feb. 22, 1983, 2989/83
Term of patent 14 years
U.S. Cl. D7—17

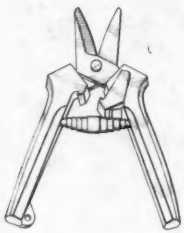


284,061
PASTRY CUTTER WITH REMOVABLE CUTTING MOLDS
So Shun, 2nd Floor, Block B, Chuan Yuan Factory Bldg., 342-344 Kwun Tong Rd., Kwun Tong, Kowloon, Hong Kong
Filed Nov. 8, 1982, Ser. No. 440,012
Claims priority, application United Kingdom, Jul. 1, 1982, 1 007 510
The portion of the term of this patent subsequent to May 27, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—43

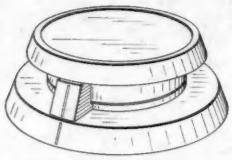


284,062
WINE CARRIER
Delvin R. Ryan, Jr., 85 E. Westminster, Lake Forest, Ill. 60045
Filed Jun. 24, 1983, Ser. No. 507,516
Term of patent 14 years
U.S. Cl. D7—77

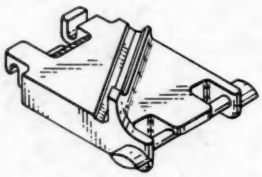
284,063
SHEARS FOR PRUNING OR THE LIKE
Erkki O. Linden, Billnäs, Finland, assignor to Fiskars Oy AB, Helsinki, Finland
Filed Jun. 14, 1983, Ser. No. 504,228
Claims priority, application Finland, Dec. 16, 1982, 1115/82
Term of patent 14 years
U.S. Cl. D8—5



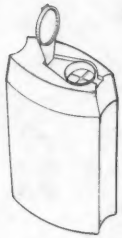
284,064
KNOB
Philip L. Poissant, Toronto, Canada, assignor to Everingham Brothers Limited, Brampton, Canada
Filed Jan. 3, 1984, Ser. No. 567,822
Claims priority, application Canada, Dec. 7, 1983, 71283
Term of patent 14 years
U.S. Cl. D8—311



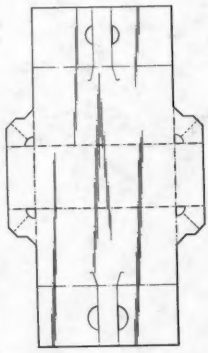
284,065
CHAIN LINK FOR CONVEYORS
Timothy W. Tod, Abergavenny; Roger J. Tod, Crickhowell, both of Wales, and Robert D. Bellis, Delph, Nr. Oldham, England, assignors to Coin Controls Limited, Oldham, England
Filed Aug. 19, 1983, Ser. No. 524,736
Claims priority, application United Kingdom, Jun. 15, 1983, 831013567
Term of patent 14 years
U.S. Cl. D8—499



284,066
CONTAINER FOR TOWELS, NAPKINS, AND THE LIKE
Varet J. Civre, Milan, Italy, assignor to Sodalco S.p.A., Corsico, Italy
Filed Jul. 5, 1983, Ser. No. 510,708
Term of patent 14 years
U.S. Cl. D9—339

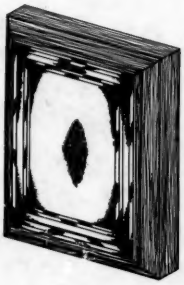


284,067
CARTON BLANK
Richard L. Schuster, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.
Filed Dec. 2, 1983, Ser. No. 557,686
Term of patent 14 years
U.S. Cl. D9—433

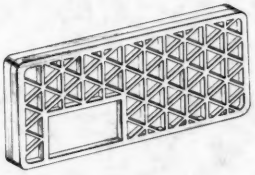


284,068
DISPENSING HEAD
John M. B. Ford, Lee's Summit, Mo., and Wallace F. Magers, Leawood, Kans., assignors to Realex Corporation, Kansas City, Mo.
Filed Apr. 21, 1983, Ser. No. 487,169
Term of patent 14 years
U.S. Cl. D9—448

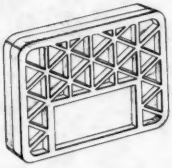
284,069
COVER PLATE FOR A CHIME OR THE LIKE
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed Jul. 26, 1984, Ser. No. 634,927
Term of patent 14 years
U.S. Cl. D10—118



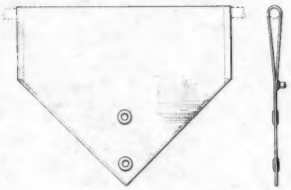
284,070
FOOT PEDAL PAD FOR AUTOMOTIVE VEHICLES
Frank T. Eichstadt, Westminster, Calif., assignor to Mr. Gasket Company, Cleveland, Ohio
Filed Nov. 4, 1983, Ser. No. 548,641
Term of patent 14 years
U.S. Cl. D12—174



284,071
PEDAL PAD FOR AUTOMOTIVE VEHICLES
Frank T. Eichstadt, Westminster, Calif., assignor to Mr. Gasket Company, Cleveland, Ohio
Filed Nov. 4, 1983, Ser. No. 548,648
Term of patent 14 years
U.S. Cl. D12—174

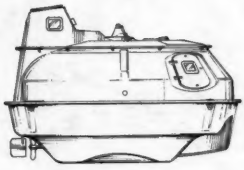


284,072
FENDER HANGER
Robert F. O'Neil, 14 Tiffany Cir., West Bridgewater, Mass. 02379
Filed Apr. 4, 1984, Ser. No. 596,650
Term of patent 14 years
U.S. Cl. D12—185

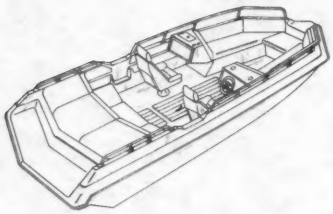


284,073
WHEEL
Michael R. Flodman, Grand Island, Nebr., assignor to Hedstrom Corporation, Bedford, Pa.
Filed Nov. 8, 1982, Ser. No. 439,950
Term of patent 14 years
U.S. Cl. D12—211

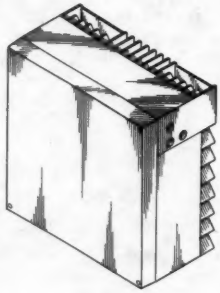
284,074
SURVIVAL CAPSULE
Eric R. Hooper, El Cajon, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.
Filed Feb. 21, 1984, Ser. No. 582,219
Term of patent 14 years
U.S. Cl. D12—308



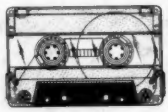
284,075
BOAT
Allan B. Hegg; Lloyd S. Makowski, both of Manistee, and James S. Phares, Farmington Hills, all of Mich., assignors to Century Boat Company, Manistee, Mich.
Filed Sep. 28, 1983, Ser. No. 536,717
Term of patent 14 years
U.S. Cl. D12—314



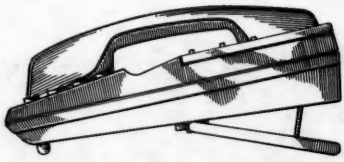
284,076
CASING FOR ELECTRICAL APPARATUS, OR THE LIKE
Jorgen J. Moeller, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Division of Ser. No. 464,055, Feb. 4, 1983. This application Jun. 5, 1985, Ser. No. 741,735
Term of patent 14 years
U.S. Cl. D13—40



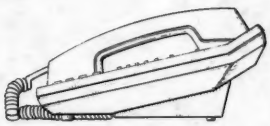
284,077
MAGNETIC TAPE CASSETTE
Katsutoshi Kikuchi, and Yoshie Nagasaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 25, 1983, Ser. No. 545,181
Claims priority, application Japan, Apr. 25, 1983, 58-17548
Term of patent 14 years
U.S. Cl. D14—11



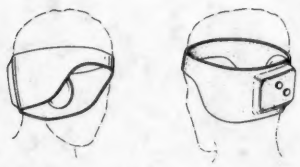
284,078
TELEPHONE
Yoku Yamagami, and Sadao Takatsuka, both of Maebashi, Japan, assignors to Nakayo Telecommunications, Inc., Tokyo, Japan
Filed Nov. 1, 1983, Ser. No. 547,625
Claims priority, application Japan, May 19, 1983, 58-20853
Term of patent 14 years
U.S. Cl. D14—53



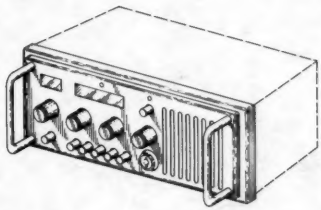
284,079
TELEPHONE INSTRUMENT
Toshio Kita; Masafuku Akatsu; Nagakazu Yokoyama, and Takeshi Nakatani, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Sep. 13, 1983, Ser. No. 534,432
Claims priority, application Japan, Mar. 18, 1983, 58-11194
Term of patent 14 years
U.S. Cl. D14—58



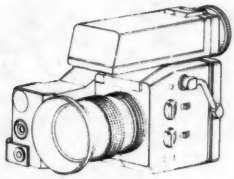
284,080
RADIO HEADBAND
Kenneth N. Swezey, Los Angeles; Thomas H. Ishimoto, Northridge, and Eric A. Daniels, Los Angeles, all of Calif., assignors to Kelton Corporation, Los Angeles, Calif.
Filed Apr. 9, 1984, Ser. No. 598,190
Term of patent 14 years
U.S. Cl. D14—70



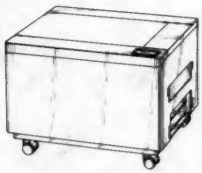
284,081
FRONT CONTROL PANEL FOR A TWO-WAY RADIO OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 12, 1984, Ser. No. 588,471
Term of patent 14 years
U.S. Cl. D14—76



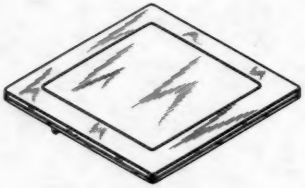
284,082
VIDEO CAMERA
Shigeki Masatsugu, Sayama; Hideyo Hyuga, Tokyo, and Yukinobu Ichikawa, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 30, 1983, Ser. No. 567,393
Claims priority, application Japan, Aug. 4, 1983, 58-28672
Term of patent 14 years
U.S. Cl. D14—78



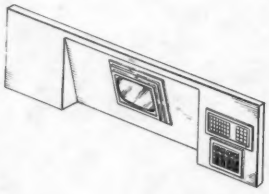
284,083
PRINTER FOR IMAGE INFORMATION STORING/RETRIEVING MACHINE
Shigeru Sutoh, Urawa; Tooru Okuyama, Isehara, and Kunio Hara, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed May 24, 1984, Ser. No. 613,616
Claims priority, application Japan, Nov. 29, 1983, 58-51469
Term of patent 14 years
U.S. Cl. D14—111



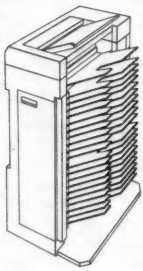
284,084
DIGITIZER
Daniel A. Ferrara, Jr., Bantam, Conn., assignor to Summagraphics Corporation, Fairfield, Conn.
Filed Mar. 21, 1983, Ser. No. 477,306
Term of patent 14 years
U.S. Cl. D14—114



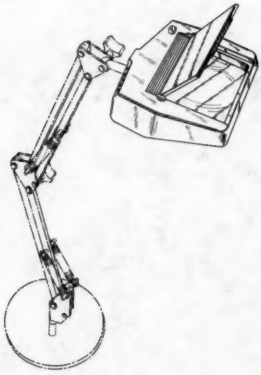
284,085
DISPLAY PANEL FOR ARMATURE WINDING MACHINE OR THE LIKE
Alvin C. Banner, Kettering; Hyman B. Finegold, Dayton, and David R. Seitz, Vandalia, all of Ohio, assignors to The Globe Tool & Engineering Company, Dayton, Ohio
Filed Jun. 17, 1983, Ser. No. 505,249
Term of patent 14 years
U.S. Cl. D15—138



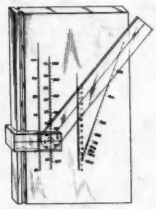
284,086
SORTER FOR COPYING MACHINE
Tetsuya Goto, Kanagawa, Japan, assignor to Richo Company, Ltd., Japan
Filed Dec. 22, 1983, Ser. No. 564,334
Claims priority, application Japan, Jun. 24, 1983, 58-027349
Term of patent 14 years
U.S. Cl. D16—32



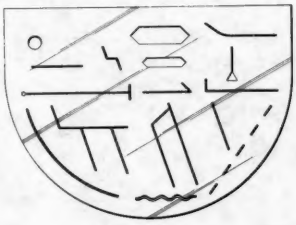
284,087
MAGNIFYING LAMP
Robert N. Haidinger, Riverside, Conn., assignor to Jac Jacobsen Industries, Inc., Norway
Filed Jan. 6, 1984, Ser. No. 568,706
Term of patent 14 years
U.S. Cl. D16—135



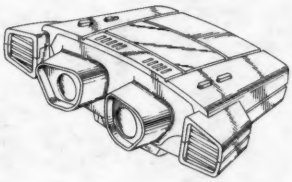
284,088
NOMOGRAPH
Erwig Pinter, Limburg/Lahn; Michael Oellerich, and Gerhard W. Sybrecht, both of Hanover, all of Fed. Rep. of Germany, assignors to The Purdue Frederick Company, New York, N.Y.
Filed Jul. 12, 1983, Ser. No. 513,037
Claims priority, application European Pat. Off., Jan. 19, 1983, 83100416.3
Term of patent 14 years
U.S. Cl. D18—9



284,089
TEMPLATE
Gretchen A. Hines, 749 Crestridge Dr., NE., Atlanta, Ga. 30306
Filed Dec. 19, 1983, Ser. No. 562,980
Term of patent 14 years
U.S. Cl. D19—39

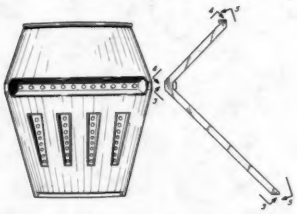


284,090
ELECTRONIC GAME HOUSING
Toshiaki Takizawa, and Akio Tsuyuki, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 5, 1984, Ser. No. 597,083
Claims priority, application Japan, Oct. 5, 1983, 58-42979
Term of patent 14 years
U.S. Cl. D21—13

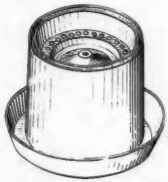


284,091
TOY FIGURE
Jose M. Arnau (Pibet), Barcelona, Spain, assignor to Exin-Iber, S.A., Spain
Filed Jul. 22, 1983, Ser. No. 516,282
Term of patent 14 years
U.S. Cl. D21—149

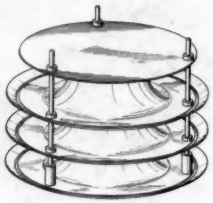
284,092
PANEL FOR AN AMUSEMENT RIDE
Victor L. Wisdom, Sterling; Mark E. Waite, Brush, and Bradford H. Rhea, Sterling, all of Colo., assignors to Wisdom Manufacturing, Inc., Sterling, Colo.
Filed Dec. 7, 1983, Ser. No. 558,370
Term of patent 14 years
U.S. Cl. D21—242



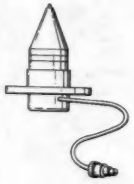
284,093
FLY TRAP
Lloyd E. Browne, Easton, Pa., assignor to Richardson-Vicks, Inc., Wilton, Conn.
Filed Jan. 23, 1984, Ser. No. 572,904
Term of patent 14 years
U.S. Cl. D22—19



284,094
CHIMNEY COVER
Armin Liniger, Amriswil, Switzerland, assignor to Technopatent AG, Switzerland
Filed Oct. 16, 1984, Ser. No. 661,408
Term of patent 14 years
U.S. Cl. D23—154

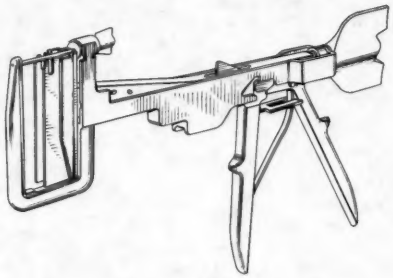


284,095
RESPIRATORY SENSOR PROBE AND HOUSING THEREFOR
Simon Ashby, 34, Caraway Rd., Fulbourn, Cambridge, CB1 5DU, England
Filed Mar. 22, 1983, Ser. No. 477,601
Term of patent 14 years
U.S. Cl. D24—17

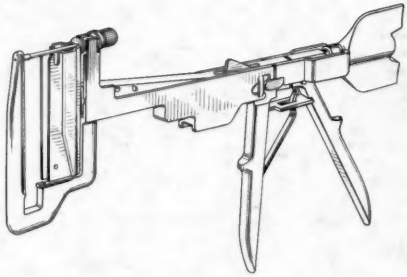


284,096
COMBINATION CASE FOR AN ELECTRONIC CALCULATOR AND THERMOMETER PROBE FOR FAMILY PLANNING
Edmond Desjacques, Thonex/Ge, Switzerland, assignor to Bioself Development S.A., Thonex-Geneve, Switzerland
Filed Mar. 9, 1983, Ser. No. 473,648
Claims priority, application Switzerland, Sep. 14, 1982, 112.598
Term of patent 14 years
U.S. Cl. D24—17

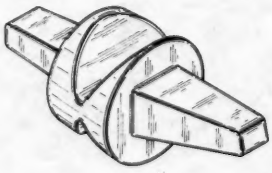
284,097
LINEAR SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Apr. 10, 1984, Ser. No. 598,785
Term of patent 14 years
U.S. Cl. D24—26



284,098
LINEAR SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Feb. 22, 1985, Ser. No. 704,288
Term of patent 14 years
U.S. Cl. D24—26

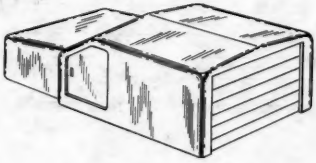


284,099
GREAT TOE METATARSAL PHALANGEAL IMPLANT
Guido A. Laporta, Scranton, Pa., and James M. Christensen, San Diego, Calif., assignors to Sutter Bio-Medical, Inc., San Diego, Calif.
Filed Mar. 14, 1983, Ser. No. 475,356
Term of patent 14 years
U.S. Cl. D24—33

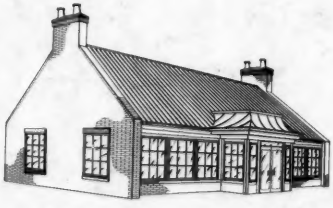


284,100
FEMORAL RASP
Robert V. Kenna, Saddle River, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.
Filed Oct. 19, 1983, Ser. No. 543,204
Term of patent 14 years
U.S. Cl. D24—33

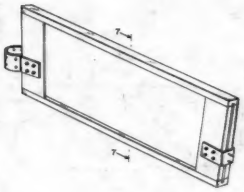
284,101
COMPACT GARAGE
John L. Latimer, 903 S. Ashland, Chicago, Ill. 60607
Filed Jul. 7, 1983, Ser. No. 511,394
Term of patent 14 years
U.S. Cl. D25—1



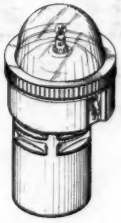
284,102
BUILDING
Rouben Simonian, Memphis, Tenn., assignor to Dobbs Houses, Inc., Memphis, Tenn.
Filed Dec. 28, 1983, Ser. No. 566,391
Term of patent 14 years
U.S. Cl. D25—22



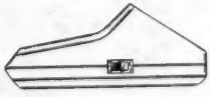
284,103
COMBINED TRUSS STRUT AND HUB CONNECTOR FOR DOME STRUCTURES
Sheldon P. Wolfe, Stacy, Minn., assignor to Daystar Shelter Corporation, Bethel, Minn.
Filed Jan. 20, 1984, Ser. No. 572,237
Term of patent 14 years
U.S. Cl. D25—61



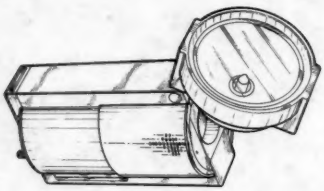
284,104
LIGHT FOR GROUND OBSTRUCTION MARKER
Peter V. Martino, 9960 65th Rd., Rego Park, N.Y. 11205
Filed Dec. 12, 1983, Ser. No. 560,437
Term of patent 14 years
U.S. Cl. D26—24



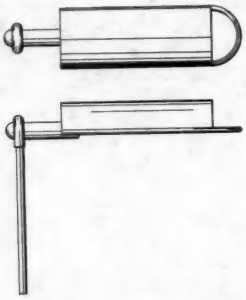
284,105
RECHARGEABLE LIGHT
Donald R. McCloskey, Trappe, Md., assignor to Black & Decker, Inc., Newark, Del.
Filed Jun. 15, 1983, Ser. No. 504,411
Term of patent 14 years
U.S. Cl. D26—37



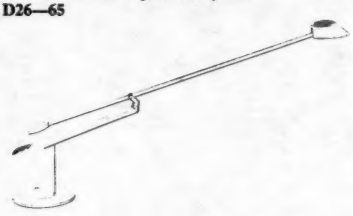
284,106
HAND LANTERN
John H. Drane, London, England, assignor to Duracell Inc., Bethel, Conn.
Filed Jan. 16, 1984, Ser. No. 571,242
Claims priority, application United Kingdom, Jul. 27, 1983, 1014319
Term of patent 14 years
U.S. Cl. D26—44



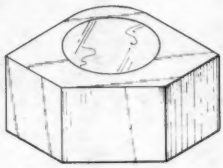
284,107
TASK LIGHT
Niels Diffrient, Ridgefield, Conn., assignor to Hauserman Inc., Cleveland, Ohio
Filed Jun. 8, 1984, Ser. No. 618,740
Term of patent 14 years
U.S. Cl. D26—63



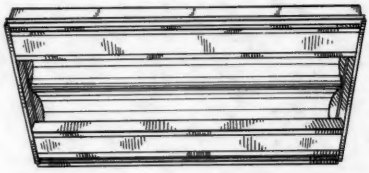
284,108
ADJUSTABLE TABLE LAMP
Rodolfo Bonetto, Milan, Italy, assignor to Iguzzini Illuminazione S.p.A., Recanati, Italy
Filed Jan. 4, 1984, Ser. No. 568,142
Claims priority, application Italy, Jul. 5, 1983, 22293/83[U]
Term of patent 14 years
U.S. Cl. D26—65



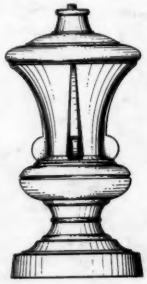
284,109
INDIRECT LIGHTING FIXTURE FOR AN OFFICE FURNITURE SYSTEM
Galen E. Seal, Jr., 28522 Paseo Diana, San Juan Capistrano, Calif. 92675
Filed Apr. 11, 1983, Ser. No. 483,497
Term of patent 14 years
U.S. Cl. D26—72



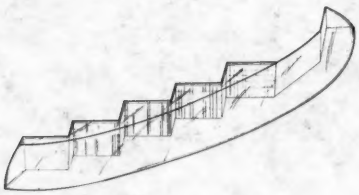
284,110
CEILING MOUNTED FLUORESCENT LIGHT
Jack R. Mullins, Missouri City, Tex., assignor to JW Lighting, Inc., Houston, Tex.
Filed Jul. 11, 1983, Ser. No. 512,488
Term of patent 14 years
U.S. Cl. D26—76



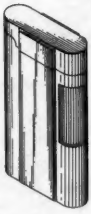
284,111
LAMP BASE
Terry Manton, Clifton, N.J., assignor to Westwood Lighting Group, Inc., Paterson, N.J.
Filed Mar. 6, 1984, Ser. No. 586,629
Term of patent 14 years
U.S. Cl. D26—110



284,112
LENS MEMBER FOR A MOTOR VEHICLE HEADLIGHTING SYSTEM
George J. English, Reading, and Robert E. Levin, South Hamilton, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Apr. 10, 1984, Ser. No. 598,606
Term of patent 14 years
U.S. Cl. D26—122



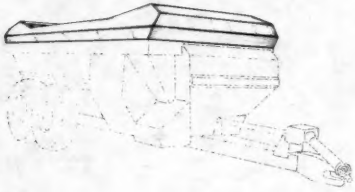
284,113
CIGARETTE LIGHTER
Lutrelle P. Wassmann, Wilmette, Ill., assignor to Zippo Manufacturing Company, Bradford, Pa.
Filed Dec. 10, 1984, Ser. No. 678,801
Term of patent 14 years
U.S. Cl. D27—42



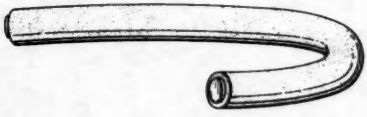
284,114
PHARMACEUTICAL TABLET
Charles H. Robson, 6241 S. 30th St., Phoenix, Ariz. 85040
Filed Dec. 15, 1983, Ser. No. 561,878
Term of patent 14 years
U.S. Cl. D28—3

284,115
PHARMACEUTICAL TABLET
Charles H. Robson, 6241 S. 30th St., Phoenix, Ariz. 85040
Filed Dec. 15, 1983, Ser. No. 561,958
Term of patent 14 years
U.S. Cl. D28—3

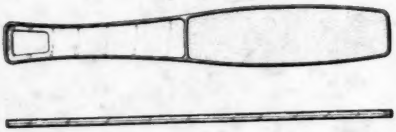
284,116
SPLASH GUARD FOR SLURRY TYPE MANURE SPREADERS
Gilbert W. Linde, Oxford, Pa., assignor to Sperry Corporation, New Holland, Pa.
Filed Aug. 13, 1984, Ser. No. 639,887
Term of patent 14 years
U.S. Cl. D15—28



284,117
HAIR ROLLER
Harvey E. Collis, London, England, assignor to Molton Brown U.S.A. Inc., London, England
Filed Nov. 9, 1982, Ser. No. 440,413
Term of patent 14 years
U.S. Cl. D28—37

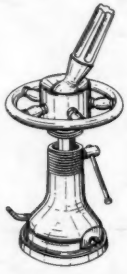


284,118
FOOT FILE
Robert L. Baumgartner, Bartlett, Tenn., assignor to Scholl, Inc., Memphis, Tenn.
Filed Aug. 2, 1984, Ser. No. 637,092
Term of patent 14 years
U.S. Cl. D28—59

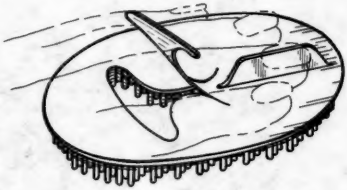


284,119
LIPSTICK CONTAINER
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Aug. 31, 1983, Ser. No. 528,128
Term of patent 14 years
U.S. Cl. D28—89

284,120
WIG MODELLING STAND
Chen K. Chao, Hong Kong, Hong Kong, assignor to The Artistic Hair Products Company Limited, Hong Kong, Hong Kong
Filed Feb. 9, 1984, Ser. No. 578,571
Claims priority, application United Kingdom, Oct. 21, 1983, 1015837
Term of patent 14 years
U.S. Cl. D28—93

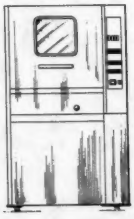


284,121
ANIMAL CURRY BRUSH
Jacquelyn N. Kelly, 203 Fuller, Camp Pendleton, Calif. 92055
Filed Nov. 7, 1983, Ser. No. 549,320
Term of patent 14 years
U.S. Cl. D30—40

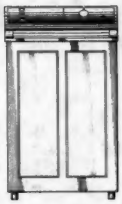


284,122
SADDLE RACK
Zigmond Kizen, 533 E. 1st St., New Richmond, Wis. 54017
Filed Jan. 6, 1984, Ser. No. 568,822
Term of patent 14 years
U.S. Cl. D30—45

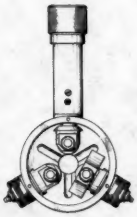
284,123
WASHER
Ramon C. Eyzaguirre, Hollywood, Fla., assignor to Heinicke Instruments Co., Hollywood, Fla.
Filed Nov. 10, 1983, Ser. No. 550,472
Term of patent 14 years
U.S. Cl. D32—2

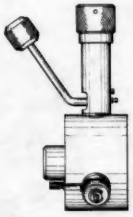


284,124
WASHING MACHINE
Kenichi Haruguchi; Katsuya Matsumura; Yamaguchi Kiminori, and Teruko Sakaguchi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 28, 1983, Ser. No. 566,483
Term of patent 14 years
U.S. Cl. D32—6



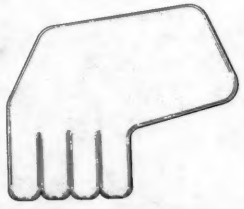
284,125
CABLE DRIVE FOR A SEWER CLEANING MACHINE
Donald D. Burke, 4321 N. Quincy, Kansas City, Mo. 64117
Filed Aug. 5, 1983, Ser. No. 520,549
Term of patent 14 years
U.S. Cl. D32—14



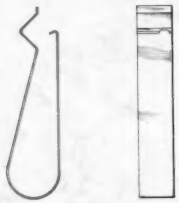


284,126
DUSTING ATTACHMENT FOR BROOMS
Claudette Landwehrmann, 3248 Jidemi Rd., Greensboro, Guilford County, N.C. 27406
Filed Nov. 26, 1982, Ser. No. 444,938
Term of patent 14 years
U.S. Cl. D32—40

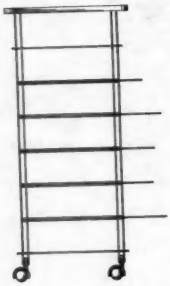
284,127
CLEANING APPLIANCE FOR VENETIAN BLINDS AND THE LIKE
Wing G. Lew, 3664 Primavera Ave., Los Angeles, Calif. 90065
Filed May 14, 1984, Ser. No. 610,309
Term of patent 14 years
U.S. Cl. D32—40



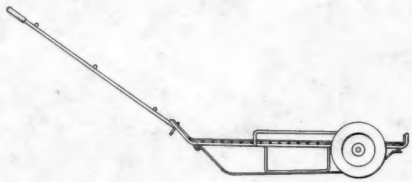
284,128
THREAD CLEANER
Paul D. Yonts, R.R. 3, Box 64, Lexington, Ind. 47138
Filed Sep. 22, 1983, Ser. No. 534,973
Term of patent 14 years
U.S. Cl. D32—46



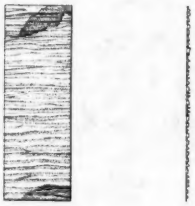
284,129
INFORMATION CART
Beverly C. Rich, 1310 Maywood Ave., Ruxton, Md. 21204
Filed Oct. 1, 1984, Ser. No. 656,709
Term of patent 14 years
U.S. Cl. D34—21



284,130
UTILITY CART
Gerald C. Peruski, 4891 Parview Dr., Waterford, Mich. 48095; Louis Peruski, 6645 Red Cedar La., Union Lake, Mich. 48085, and Bryan M. Peruski, 4891 Parview Dr., Waterford, Mich. 48095
Filed Nov. 7, 1984, Ser. No. 669,244
Term of patent 14 years
U.S. Cl. D34—24



284,131
TEXTILE WALL COVERING
Anton R. Czerny, Oberursel, Fed. Rep. of Germany, assignor to Taunus Textildruck Zimmer GmbH & Co. KG, Oberursel, Fed. Rep. of Germany
Filed May 25, 1983, Ser. No. 497,865
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 23 012-Dr.H./LU
Term of patent 14 years
U.S. Cl. D5—53



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JUNE, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Cale, Albert D., Jr., 4,592,866, Cl. 260-239.30T.
Munson, Harry R., Jr.; and Boswell, Robert F., Jr., 4,593,034, Cl. 514-305.000.
Shanklin, James R., Jr., 4,593,102, Cl. 546-216.000.

A.R.L. Applied Research Laboratories, S.A.: *See*—
Slickers, Karl, 4,592,655, Cl. 356-313.000.

A/S Ferrosan: *See*—
Lassen, Jorgen B.; Christensen, Jorgen A.; Petersen, Erling N.; and Hansen, John B., 4,593,036, Cl. 514-317.000.

Ab-Ag Laboratories Limited: *See*—
Blackmore, David J., 4,592,338, Cl. 128-1.00R.

Abacus Municipal Limited: *See*—
Pratt, John W., 4,592,177, Cl. 52-116.000.

Abatjoglou, Anthony G.; and Bryant, David R., to Union Carbide Corporation. Hydroformylation process using triarylphosphine and bisphosphine monooxide ligands. 4,593,011, Cl. 502-161.000.

Abbott Laboratories: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,593,089, Cl. 536-13.600.

Abe, Shigeru: *See*—
Asano, Satoru; and Abe, Shigeru, 4,592,297, Cl. 112-443.000.

Abel, Irving R., to Honeywell Inc. Autofocus system for infrared imaging device. 4,593,322, Cl. 358-227.000.

Abreu, Rene: *See*—
Grotts, Jeffrey W.; and Abreu, Rene, 4,593,187, Cl. 250-203.00R.

Acampora, Anthony; Hluchjy, Michael G.; and Tsao, Chan D., to AT&T Information Systems Inc. Network protocol for integrating synchronous and asynchronous traffic on a common serial data bus. 4,593,282, Cl. 340-825.500.

Acerbi, Sergio: *See*—
Guglielmi, Mauro; Pighetti, Antonio; Vezzani, Savino; and Acerbi, Sergio, 4,592,533, Cl. 251-30.010.

Achia, Biddanda U.: *See*—
Bristow, Duncan J.; Achia, Biddanda U.; and Evers, Lawrence J., 4,592,832, Cl. 208-309.000.

Ackeret, Peter: *See*—
Bohnet, Klaus; and Ackeret, Peter, 4,592,600, Cl. 312-12.000.

Ackerley, Kenneth E.: *See*—
Cousins, Steven J.; Jones, Keith N.; and Ackerley, Kenneth E., 4,592,587, Cl. 297-284.000.

Actionair Equipment Limited: *See*—
Magill, Robert J.; and Gaiger, David J., 4,592,535, Cl. 251-298.000.

Adachi, Eiichi: *See*—
Kanda, Hajime; Murase, Katsuo; Hishida, Hiroshi; Adachi, Eiichi; Wada, Yoshinori; and Koseki, Yuji, 4,593,323, Cl. 358-256.000.

Adachi, Keiichi: *See*—
Yoshida, Tetsuo; Kokubo, Tadayoshi; Adachi, Keiichi; Ikeda, Tadashi; and Kobayashi, Hidetoshi, 4,592,991, Cl. 430-139.000.

Adachi, Toshiyuki: *See*—
Aida, Mitsuo; Kudomi, Mitsuharu; and Adachi, Toshiyuki, 4,593,276, Cl. 340-664.000.

Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, to VEB Berlin-Chemie. Compositions for combatting phytopathogenical fungi and bacteria employing mixtures of benzyl phenol derivatives and carbendazin. 4,593,040, Cl. 514-395.000.

Adams, James E.; Koontz, Ernest T., Jr.; and Russell, Steven D., to Armstrong World Industries, Inc. Furniture server/desk. 4,592,603, Cl. 312-241.000.

Adir, S.A.R.L.: *See*—
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; Duhault, Jacques; and Roman, Francois, 4,593,026, Cl. 514-245.000.

Adolph Coors Company: *See*—
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.
Thompson, Roger A., 4,593,369, Cl. 364-552.000.

Adolph, Horst G.: *See*—
Goldwasser, Judah M.; Adolph, Horst G.; and Ebner, Cynthia L., 4,593,110, Cl. 549-347.000.

Advance Transformer Co.: *See*—
Wisbey, Robert W.; and Droho, Joseph S., 4,593,231, Cl. 315-100.000.

AE PLC: *See*—
Allen, Gordon L., 4,592,405, Cl. 164-120.000.
Davies, Glyndwr J., 4,592,782, Cl. 75-253.000.

Aeroquip Corporation: *See*—
Hughes, Brett A.; and Gilbert, David L., 4,592,575, Cl. 285-252.000.
Rogers, Russell L., 4,592,387, Cl. 137-614.060.

Agfa-Gevaert AG: *See*—
Freitag, Friedbert; Hujer, Friedrich; Nagel, Erich; Payrhammer, Bernd; and Zahn, Wolfgang, 4,592,649, Cl. 355-43.000.

Ahlbrecht, Horst: *See*—
Butefisch, Karl-Aloys; and Ahlbrecht, Horst, 4,592,229, Cl. 73-147.000.

Aida, Mitsuo; Kudomi, Mitsuharu; and Adachi, Toshiyuki, to Takamatsu Electric Works, Ltd. Overcurrent display device. 4,593,276, Cl. 340-664.000.

Aikens, Donald T.: *See*—
Benjamin, Loftus A.; Aikens, Donald T.; Gravestock, Thomas B.; and Soehodho, Herman, 4,592,771, Cl. 71-34.000.

Air Preheater Company, Inc., The: *See*—
Mattison, Glenn D.; and Case, Michael A., 4,592,416, Cl. 165-83.000.

Air Products and Chemicals, Inc.: *See*—
Butter, Stephen A.; and Stoll, Ilse, 4,593,147, Cl. 585-733.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Matsuo, Masashi; Miura, Yasushi; and Nakayoshi, Hideki, 4,592,706, Cl. 418-171.000.

Ajinomoto Company, Inc.: *See*—
Higuchi, Ryoichi; Honma, Masao; Sakurai, Takao; and Mikami, Naoko, 4,592,858, Cl. 252-299.660.

Akamatsu, Hiroyuki: *See*—
Ikeda, Takashi; Sawayama, Noboru; and Akamatsu, Hiroyuki, 4,592,653, Cl. 355-3.0DD.

Akase, Shinichiro: *See*—
Kobayashi, Taishi; and Akase, Shinichiro, 4,592,856, Cl. 252-162.000.

Akesson, Yngve R., to Nestec S.A. Method and apparatus for forming cakes. 4,592,916, Cl. 426-517.000.

Akimoto, Shin-ichi; and Suginaka, Akinori, to Nippon Oil and Fats Co., Ltd. Hair-rinse liquid with pearly luster. 4,592,907, Cl. 424-70.000.

Akiyama, Junichi; Chiba, Shu; and Sawazaki, Norikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic reproduction system utilizing magnetic body as capacitor. 4,593,332, Cl. 360-111.000.

Aktiebolaget Bofors: *See*—
Hellner, Lars; Haglund, Ingemar; Ronn, Torsten; and Albrektsson, Kjell, 4,592,283, Cl. 102-493.000.

Aktiebolaget Leo: *See*—
Kristensson, Sten K.; and Stamvik, Anders R., 4,592,869, Cl. 260-397.400.

Aktiengesellschaft Adolph Saurer: *See*—
Oesterle, Gerhard; and Hutter, Wilhelm, 4,593,236, Cl. 318-7.000.

Akzo N.V.: *See*—
de Wied, David, 4,593,017, Cl. 514-16.000.

Al-Ko Products, Inc.: *See*—
Shifflett, David C.; Shifflett, Daniel J.; and Shifflett, Dennis I., 4,592,731, Cl. 434-184.000.

Alb. Klein GmbH & Co. KG: *See*—
Boiting, Hans H.; Federhen, Bernd; and Muller-Spath, Gerhard, 4,592,679, Cl. 406-127.000.

Albert, Donn E., to McDonnell Douglas Corporation. End retract device for completing spherically shaped reflective film. 4,592,717, Cl. 425-400.000.

Albrecht, Ursula: *See*—
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.

Albrechtson, Loren R.; Reif, Robert B.; and Thompson, William B. Laminated electroluminescent lamp structure and method of manufacturing. 4,593,228, Cl. 313-509.000.

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Hellner, Lars; Haglund, Ingemar; Ronn, Torsten; and Albrektsson, Kjell, 4,592,283, Cl. 102-493.000.

Alcan Aluminio Do Brasil S/A: *See*—
Resende, Irineu, 4,592,479, Cl. 220-209.000.

Alcan International Limited: *See*—
McGeer, James P., 4,592,820, Cl. 204-243.00R.

Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., to Halomet, Inc. Ferrite toner carrier core composition derived from fly ash. 4,592,988, Cl. 430-107.000.

Alfa-Laval AB: *See*—
Mattiasson, Bo G., 4,592,994, Cl. 435-7.000.

Alfonso, Giovanni C.: *See*—
Russo, Saverio; Alfonso, Giovanni C.; Turturro, Antonio; and Pedemonte, Enrico, 4,593,076, Cl. 525-425.000.

Alford, Thomas G., Jr.: *See*—
Warnock, Rudolph M.; Alford, Thomas G., Sr.; and Alford, Thomas G., Jr., 4,592,564, Cl. 280-402.000.

Alford, Thomas G., Sr.: *See—*
Warnock, Rudolph M.; Alford, Thomas G., Sr.; and Alford, Thomas G., Jr., 4,592,564, Cl. 280-402.000.

Allen, Gordon L., to AE PLC. Squeeze casting of articles. 4,592,405, Cl. 164-120.000.

Alles, Harold G., to AT&T Bell Laboratories. Pressure and optical sensitive device with deformable protrusions. 4,593,191, Cl. 250-227.000.

Allied Corporation: *See—*
Bedell, John R.; and Liebermann, Howard H., 4,592,411, Cl. 164-463.000.
Chlanda, Frederick P.; and Mani, Krishnamurthy N., 4,592,817, Cl. 204-182.400.
Meyer, Helmut P., 4,593,340, Cl. 361-253.000.

Allied Tube & Conduit Corporation: *See—*
Vollmuth, Lawrence P.; and Porthan, Robert J., 4,592,574, Cl. 285-31.000.

Alprokon Promotie en Ontwikkeling B.V.: *See—*
van Herpen, Frederik C., 4,592,176, Cl. 52-96.000.

Alps Electric Co., Ltd.: *See—*
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,592,963, Cl. 428-544.000.

Alsthom-Atlantique: *See—*
Lejeune, Pierre; and Berthod, Louis, 4,592,845, Cl. 210-715.000.

Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., to International Business Machines. Mirror array light valve. 4,592,628, Cl. 350-486.000.

Aluminium Pechiney: *See—*
Keinborg, Maurice; Langon, Bernard; and Chaffy, Joseph, 4,592,821, Cl. 204-244.000.

Aluminum Company of America: *See—*
Bowman, Kenneth A., 4,592,511, Cl. 241-14.000.
Henry, George H., 4,592,813, Cl. 204-67.000.
Ramser, Robert A., 4,592,879, Cl. 264-12.000.

Amada, Haruo, to Hitachi, Ltd. Method and apparatus for the heat-treatment of a plate-like member. 4,593,168, Cl. 219-10.55M.

Amano, Satoru; Horiuchi, Shigenori; and Shinohara, Takeru, to Hoya Corporation. Acoustooptic modulation element and system for acoustooptically carrying out modulation of a plurality of parallel beams by the use of a single acoustooptic medium. 4,592,621, Cl. 350-358.000.

Amelio, William J.; Jung, Dae Y.; Markovich, Voya; and Sambucetti, Carlos J., to International Business Machines Corporation. Process for manufacturing a concentrate of a palladium-tin colloidal catalyst. 4,593,016, Cl. 502-339.000.

American Can Co.: *See—*
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,592,668, Cl. 400-127.000.

American Cyanamid Company: *See—*
Casey, Donald J.; and Trzaskos, William J., 4,593,130, Cl. 568-427.000.
Floyd, Middleton B., Jr.; and DeVries, Vern G., 4,592,876, Cl. 260-511.000.

American Hoechst Corporation: *See—*
Farrar, Grover L.; and Culbertson, E. C., 4,592,953, Cl. 428-332.000.
Hsieh, Shane; and Mitchell, Wayne A., 4,592,992, Cl. 430-309.000.

American Home Products Corporation: *See—*
Kim, Dong H., 4,593,100, Cl. 546-115.000.

American Hospital Supply Corporation: *See—*
Erhardt, Paul W.; and Borgman, Robert J., 4,593,119, Cl. 560-42.000.

American Magnetics Corporation: *See—*
Baus, Rene Jr., 4,593,328, Cl. 360-2.000.

American Optical Corporation: *See—*
Maryyanek, Richard D.; and Zdrok, Joseph Z., 4,592,350, Cl. 128-206.170.

American Science and Engineering, Inc.: *See—*
Chase, Richard C., 4,593,355, Cl. 364-414.000.

Ames, Adolf: *See—*
Wagner, Alfred; and Ames, Adolf, 4,592,224, Cl. 72-264.000.

AMP Incorporated: *See—*
Hatfield, John G., 4,592,253, Cl. 81-9.510.
Myers, Earl C., Jr., 4,592,614, Cl. 339-154.00A.
Nitschke, Reinhard, 4,592,611, Cl. 339-91.00R.

Amstutz, Jean-Pierre, to Bucher-Guyer AG. Processing apparatus for stalk-shaped agricultural products. 4,592,194, Cl. 56-16.400.

Ancelle, Bernard; and Lambert, Serge, to Rhone-Poulenc Specialites Chimiques. Equipment and process for the treatment of swimming pool water with a semi-permeable membrane. 4,592,841, Cl. 210-651.000.

Anderson, C. Keith; Vieth, George C., Jr.; Vance, Lane D.; and Grant, Darwin D., to Meals Incorporated. Meal vending apparatus. 4,592,485, Cl. 221-150.0HC.

Anderson, Gerald L.: *See—*
Babu, Suresh P.; Anderson, Gerald L.; and Nandi, Satyendra P., 4,592,762, Cl. 48-197.00R.

Anderson, Nathaniel C.; Daby, Larry E.; Johnson, Gene A.; and McCaffrey, Patrick M., to International Business Machines Corporation. Thin film transducer. 4,593,334, Cl. 360-126.000.

Anderson, Robert L., Jr., to August Systems. Process for a fault-tolerant data processing system with error detection and resistance to fault propagation. 4,593,396, Cl. 371-68.000.

Andrawos, Emile, to Combi Door Australia Pty. Ltd. Doors. 4,592,167, Cl. 49-171.000.

Andrevski, Zygmunt M.: *See—*
Martinez, Miguel R.; Andrevski, Zygmunt M.; and Mitchell, William J., Jr., 4,592,220, Cl. 72-16.000.

Andrews, Brackin L.: *See—*
Vogdes, Christine E.; and Andrews, Brackin L., 4,593,061, Cl. 524-417.000.

Andrews, Gary E. Fastening device. 4,592,686, Cl. 410-101.000.

Anjos, Theodore R.: *See—*
Proctor, Robert H.; and Anjos, Theodore R., 4,592,576, Cl. 285-253.000.

Antebi, Eliahu. Process for tying live tissue and an instrument for performing the tying operation. 4,592,355, Cl. 128-326.000.

Antonen, Robert C., to Dow Corning Corporation. Method and compositions for inhibiting leakage current in silicon diodes. 4,592,928, Cl. 427-93.000.

Anzai, Satoru: *See—*
Uehara, Makoto; Anzai, Satoru; and Suwa, Kyoichi, 4,592,625, Cl. 350-415.000.

Aoki, Eiichi; and Kobayashi, Hideyuki, to Daiken Trade & Industry Co., Ltd. Process for acetylating a wood material. 4,592,962, Cl. 428-541.000.

Aoki, Junji: *See—*
Miyatake, Kimio; and Aoki, Junji, 4,593,197, Cl. 250-343.000.

Aoshima, Terutaka: *See—*
Narita, Ryuho; and Aoshima, Terutaka, 4,593,180, Cl. 219-492.000.

Aqua-Giene, Inc.: *See—*
Rubin, Sol R.; and Robinson, Joseph D., 4,592,382, Cl. 137-218.000.

Araki, Hitoshi: *See—*
Yokoya, Yuji; Buma, Shuuichi; and Araki, Hitoshi, 4,592,540, Cl. 267-8.00R.

Arditty, Herve : *See—*
Huignard, Jean-Pierre; and Arditty, Herve , 4,592,618, Cl. 350-3.610.

Arends, Charles B.: *See—*
Jones, Mary Ann; and Arends, Charles B., 4,593,063, Cl. 524-505.000.

Arimoto, Akira: *See—*
Hashimoto, Akira; Saito, Susumu; Arimoto, Akira; and Morita, Kenji, 4,592,622, Cl. 350-395.000.

Arioka, Hiroyuki: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,592,942, Cl. 428-148.000.

Arita, Setsuo; and Sato, Takao, to Hitachi, Ltd. Middle value selection circuit. 4,593,249, Cl. 328-137.000.

Armex Cable Corporation: *See—*
Drew, Thomas J.; and Day, Frank S., 4,592,616, Cl. 339-177.00R.

Armstrong, Bruce G.; Principi, Fabio; and Marcellino, John G., to Raytheon Company. Integated circuit memory. 4,593,383, Cl. 365-203.000.

Armstrong World Industries, Inc.: *See—*
Adams, James E.; Koontz, Ernest T., Jr.; and Russell, Steven D., 4,592,603, Cl. 312-241.000.

Arnaud, Michel; and Corbet, Jean-Pierre, to Rhone-Poulenc Sante. Process for the preparation of 4-quinolinones. 4,593,101, Cl. 546-153.000.

Asahi Glass Company, Ltd.: *See—*
Takabatake, Mitsuo; Chiba, Jiro; and Kokubu, Yoshinori, 4,593,006, Cl. 501-32.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nakane, Toshiaki, 4,592,631, Cl. 351-206.000.

Asahi Yukisai Kogyo Co. Ltd.: *See—*
Ueda, Tomoyuki; and Ogawa, Hirotoshi, 4,592,534, Cl. 251-266.000.

Asami, Kazutomo: *See—*
Ueda, Sei; Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Asami, Kazutomo; and Wada, Fumio, 4,592,705, Cl. 418-63.000.

Asano, Kozo: *See—*
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, 4,593,097, Cl. 544-347.000.

Asano, Masakazu: *See—*
Sakata, Masataka; and Asano, Masakazu, 4,592,449, Cl. 187-9.00E.

Asano, Masamichi: *See—*
Iwahashi, Hiroshi; and Asano, Masamichi, 4,593,203, Cl. 307-202.100.

Asano, Satoru; and Abe, Shigeru, to Brother Kogyo Kabushiki Kaisha. Needle centering device and cutter for a zig-zag sewing machine. 4,592,297, Cl. 112-443.000.

ASEA Aktiebolag: *See—*
Bijlenga, Bo; Hok, Bertil; and Nilsson, Maria, 4,592,664, Cl. 374-131.000.

ASEA Stal AB: *See—*
Olsson, Mats; and Sandstrom, Roland, 4,592,292, Cl. 110-347.000.

Ashizawa, Tadashi: *See—*
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, 4,593,097, Cl. 544-347.000.

Asmussen, Erik; and Munksgaard, Erik C., to Bayer Aktiengesellschaft. Adhesion promoting agent, process for its preparation and use thereof on collageneous material. 4,593,054, Cl. 523-118.000.

Association Generale des Producteurs de Mais: *See—*
Pregermain, Jacques, 4,592,484, Cl. 221-13.000.

Astro Machine Corporation: *See—*
Selak, Martin, 4,592,542, Cl. 271-9.000.

AT&T Bell Laboratories: *See—*
Alles, Harold G., 4,593,191, Cl. 250-227.000.

Candy, James C., 4,593,271, Cl. 340-347.0DA.
Eng, Kai Y.; Haskell, Barin G.; and Schmidt, Robert L., 4,593,318, Cl. 358-142.000.
Stall, Richard A., 4,592,927, Cl. 427-87.000.
AT&T Information Systems Inc.: *See—*
Acampora, Anthony; Hluchjy, Michael G.; and Tsao, Chan D., 4,593,282, Cl. 340-825.500.
Berkowitz, Paul R., 4,593,272, Cl. 340-500.000.
AT&T Technologies, Inc.: *See—*
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,592,955, Cl. 428-389.000.
Wong, Ching-Ping, 4,592,959, Cl. 428-450.000.
Atlantic Richfield Company: *See—*
Dean, Barry D., 4,593,066, Cl. 525-66.000.
Dean, Barry D., 4,593,074, Cl. 525-331.700.
Hinney, Harry R.; and Murphy, John R., 4,593,128, Cl. 568-701.000.
Kesling, Haven S., Jr.; and Gillman, Hyman D., 4,592,875, Cl. 252-551.000.
Usui, Masahiro; and Higashio, Yasuhiko, 4,593,012, Cl. 502-167.000.
Withers, Howard P., 4,593,139, Cl. 585-500.000.
Atwood, Wesley W.: *See—*
Smith, Hudson C.; Atwood, Wesley W.; Myrick, John S.; and Sweat, Samuel F., 4,592,901, Cl. 423-320.000.
Audioplan Renate Kuhn: *See—*
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Auger, Mederic E.: *See—*
Viertl, John R. M.; and Auger, Mederic E., 4,593,245, Cl. 324-238.000.
August Systems: *See—*
Anderson, Robert L., Jr., 4,593,396, Cl. 371-68.000.
Austen, Brian M.; Cliffe, Steven; Grant, David; and Hermon-Taylor, John, to National Research Development Corp. Oligopeptide aldehydes useful as specific inhibitors of enterokinase. 4,593,018, Cl. 514-16.000.
Australian Wire Industries Pty. Ltd.: *See—*
Summers, Warwick R.; and Cross, Rodney C., 4,593,244, Cl. 324-230.000.
Autoflug GmbH: *See—*
Nohren, Hubert; and Sturzenbecher, Bruno, 4,592,524, Cl. 244-151.00B.
Autola Stromrichter GmbH & Co. KG: *See—*
Tewesmeier, Werner, 4,593,348, Cl. 363-85.000.
Avila, Arthur F.: *See—*
Lee, John J.; Avila, Arthur F.; Danby, Hal C.; and Beigler, Myron A., 4,592,370, Cl. 128-746.000.
Avrameas, Stratis; and Ternynck, Therese M. F., to Etablissement Declare d'Utilite Publique Dit: Institut Pasteur. Process for coupling biological substances by covalent bonds. 4,592,998, Cl. 435-28.000.
Awakowicz, Erwin; and Kleine, Peter, to Siemens Aktiengesellschaft. Telephone subscriber station with a pivotably attached chassis and upper housing. 4,593,158, Cl. 179-100.00R.
Awater, Albert: *See—*
Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., 4,592,957, Cl. 428-402.210.
Ayres, Paul S.; Stark, Louis E.; Feldstein, Joel G.; and Fu, Tzerong, to Babcock & Wilcox Company, The. Sleeve type repair of degraded nuclear steam generator tubes. 4,592,577, Cl. 285-287.000.
Babcock & Wilcox Company, The: *See—*
Ayres, Paul S.; Stark, Louis E.; Feldstein, Joel G.; and Fu, Tzerong, 4,592,577, Cl. 285-287.000.
Babu, Suresh P.; Anderson, Gerald L.; and Nandi, Satyendra P., to Institute of Gas Technology. Process for gasification of cellulosic biomass. 4,592,762, Cl. 48-197.00R.
Bach, Hanswilhelm: *See—*
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, 4,593,126, Cl. 568-454.000.
Bachino, Denise, administrator: *See—*
Lee, William W. Y.; Shaw, Gareth L.; Clayton, James W., deceased; and Bachino, Denise, administrator, 4,592,132, Cl. 29-590.000.
Baddour, Raymond F.: *See—*
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Bagolini, Carlo: *See—*
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Bahr, Theodor: *See—*
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Bahrmann, Helmut: *See—*
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Baird Corporation: *See—*
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Baird, Donald H.: *See—*
Proud, Joseph M.; Baird, Donald H.; Kramer, Jerry M.; and Lester, Joseph E., 4,593,397, Cl. 372-82.000.
Baker, James A., to Graesser Laboratories, Ltd. Ultra-violet absorbing compounds and compositions containing said compounds. 4,592,906, Cl. 424-60.000.
Baker, Lionel R., to Sira Limited. Method and apparatus for producing aspherical surfaces. 4,592,684, Cl. 409-132.000.
Baldwin, John J.; Varga, Sandor L.; and Ponticello, Gerald S., to Merck & Co., Inc. 1-aryloxy-3-(substituted aminoalkylamino)-2-propanols. 4,593,039, Cl. 514-362.000.
Baliva, Michael G. Concrete manhole. 4,592,674, Cl. 404-25.000.
Balkanli, Hayati. Environmental measuring and recording apparatus. 4,593,370, Cl. 364-571.000.
Ballu, Patrick J. M., to Tecnoma. Herbicide applicator. 4,592,164, Cl. 47-1.500.
Baltimore Aircoil Company, Inc.: *See—*
Scrivnor, Warren A., 4,592,878, Cl. 261-111.000.
Bandai, Yoshiaki; and Hasebe, Khoki, to Tokyo Shibaura Denki Kabushiki Kaisha. Line generating method. 4,593,372, Cl. 364-719.000.
Bando, Satoshi; Tanii, Hirokuni; and Ohfuji, Yoshio, to Kuraray Co., Ltd. Method of producing shaped resinous articles. 4,592,887, Cl. 264-337.000.
Bank of America NT&SA, administrator: *See—*
Vaughan, Ronald J., deceased; and Bank of America NT&SA, administrator, 4,592,814, Cl. 204-78.000.
Banta, Ira C.; and Caro, Wayne H., to Cepeda Associates, Inc. Removable electric heating assembly for fluid heaters and boilers. 4,593,178, Cl. 219-315.000.
Barkan, Edward: *See—*
Swartz, Jerome; Barkan, Edward; and Harrison, Shelley, 4,593,186, Cl. 235-472.000.
Barmag Barmer Maschinenfabrik AG: *See—*
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Barnhart Industries, Inc.: *See—*
DeWoskin, Irvin S., 4,592,118, Cl. 24-444.000.
Baron, Walter J., to Water Services of America, Inc. Heat exchanger tube cleaning element capturing device with offset stop. 4,592,417, Cl. 165-95.000.
Barthomeuf, Denise M., to Exxon Research and Engineering Co. Process for separating ethylbenzene from xylenes by selective adsorption on a cesium substituted X zeolite. 4,593,149, Cl. 585-828.000.
Barthomeuf, Denise M., to Exxon Research and Engineering Co. Process for enhancing the separation of paraxylene from a feedstream containing other xylenes and ethylbenzene using a zeolite adsorbent. 4,593,150, Cl. 585-828.000.
BASF Aktiengesellschaft: *See—*
Eicken, Karl; Rohr, Wolfgang; Zeeh, Bernd; and Wurzer, Bruno, 4,593,104, Cl. 548-262.000.
Fikentscher, Rolf; Mertens, Heinrich; and Reincke, Klaus, 4,592,757, Cl. 8-567.000.
Fikentscher, Rolf; Mertens, Heinrich; Reincke, Klaus; and Vescia, Michele, 4,592,758, Cl. 8-567.000.
Basile, Joseph L. Light fixture with retainer. 4,593,344, Cl. 362-226.000.
Bass, Alan S.; and Lee, Shi-Chuan, to Motorola, Inc. Macrocell array having an on-chip clock generator. 4,593,205, Cl. 307-269.000.
Bassous, Ernest: *See—*
Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., 4,592,628, Cl. 350-486.000.
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, to Communate Europeenne de l'Energie Atomique (Euratom); and Commissariat a l'Energie Atomique. Container monitoring system using ultrasonic seals. 4,592,236, Cl. 73-602.000.
Battelle Development Corporation: *See—*
Marchant, D. D.; and Begej, Stefan, 4,593,306, Cl. 357-45.000.
Bauer, Beverly A., to Ethyl Corporation. 2-amido-3-aminocarboxylic acid esters and process of preparation thereof. 4,593,118, Cl. 560-41.000.
Bauer, Hermann: *See—*
Spielmann, Norbert; Gussbacher, Udo; Walter, Wolfgang; Bauer, Hermann; and Porzel, Rainer, 4,592,438, Cl. 180-89.100.
Bauer, Karl; and Hanisch, Michael, to Barmag Barmer Maschinenfabrik AG. Air jet yarn entangling apparatus. 4,592,119, Cl. 28-271.000.
Baugh, Charles R.; Hilpert, Edwin J.; Kushin, George R.; Park, Yoon B.; and Dambrackas, William A., to Racal Data Communications Inc. Method and apparatus for maximizing efficiency in satellite communications. 4,593,399, Cl. 375-104.000.
Bauman, Jack: *See—*
Wallace, Robert S., 4,592,468, Cl. 206-387.000.
Bauman, Therese M.; Lee, Chi-Long; and Rabe, James A., to Dow Corning Corporation. Method of producing elastomeric silicone foam. 4,593,049, Cl. 521-99.000.
Baumann, Karl-Heinz; Mang, Uli; and Schwede, Wolfgang, to Daimler-Benz Aktiengesellschaft. Roll bar for a motor vehicle. 4,592,571, Cl. 280-756.000.
Baus, Rene Jr., to American Magnetics Corporation. Timing wheel for card encoder. 4,593,328, Cl. 360-2.000.
Baxter Travenol Laboratories, Inc.: *See—*
Murtfeldt, Robert L., 4,592,920, Cl. 427-2.000.
Bayer Aktiengesellschaft: *See—*
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Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., 4,592,957, Cl. 428-402.210.
Hoffmann, Jurgen; and Preis, Lothar, 4,592,421, Cl. 166-66.000.
Knofel, Hartmut; Penninger, Stefan; Hammen, Gunther; and Heitkamper, Peter, 4,593,117, Cl. 560-025.000.
Kraatz, Udo; Reiser, Wolf; Buchel, Karl H.; and Lurssen, Klaus, 4,592,772, Cl. 71-76.000.
Stammann, Gunter; Grolig, Johann; Becker, Robert; and Waldmann, Helmut, 4,593,116, Cl. 560-24.000.

BBC Brown, Boveri & Co., Ltd.: *See*—
Kyrian, Bohumil, 4,593,410, Cl. 455-109.000.
Mayer, Andreas, 4,592,330, Cl. 123-559.000.

Beach, Ronald I.: *See*—
Hardman, Harley F.; and Beach, Ronald I., 4,593,015, Cl. 502-303.000.

Beasley, Marvin D., to McCord Heat Transfer Corporation. Heat exchanger core construction utilizing a plate member adaptable for producing either a single or double pass flow arrangement. 4,592,414, Cl. 165-76.000.

Beaubron, Alain: *See*—
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.

Beazley, Phillip M.: *See*—
Plummer, Mark A.; and Beazley, Phillip M., 4,592,905, Cl. 423-573.00R.

Beck, Alfred. Circular-knitting machine. 4,592,215, Cl. 66-216.000.

Beck, Theodore R.; and Brooks, Richard J., to Electrochemical Technology Corp.; and Brooks Rand, Ltd. Method and apparatus for electrolytic reduction of alumina. 4,592,812, Cl. 204-67.000.

Becker, Robert: *See*—
Stammann, Gunter; Grolig, Johann; Becker, Robert; and Waldmann, Helmut, 4,593,116, Cl. 560-24.000.

Becking, Donald H.: *See*—
Fong, Jaan J.; and Becking, Donald H., 4,592,809, Cl. 204-44.200.

Bedell, John R.; and Liebermann, Howard H., to Allied Corporation. Method of and apparatus for continuously casting metal filament in a vacuum. 4,592,411, Cl. 164-463.000.

Beecham Group p.l.c.: *See*—
Hindley, Richard M., 4,593,023, Cl. 514-233.000.

Beere, Richard F. Deburring machine. 4,592,685, Cl. 409-138.000.

Begej, Stefan: *See*—
Marchant, D. D.; and Begej, Stefan, 4,593,306, Cl. 357-45.000.

Beggs, William C. Panoramic optical system with very sharp beam control. 4,593,345, Cl. 362-267.000.

Behr, Norbert; von Ettingshausen, Othmar; Wust, Reinhold; and van der Mei, Henk, deceased (by Reek, Jannette van der Mei nee, executrix), to Degussa Aktiengesellschaft. Extraction of camomile with liquid carbon dioxide. 4,592,911, Cl. 424-195.100.

Behringwerke Aktiengesellschaft: *See*—
Bohn, Hans; and Winckler, Wilhelm, 4,592,863, Cl. 530-350.000.

Beier, John K. Hair curling roller. 4,592,375, Cl. 132-39.000.

Beigler, Myron A.: *See*—
Lee, John J.; Avila, Arthur F.; Danby, Hal C.; and Beigler, Myron A., 4,592,370, Cl. 128-746.000.

Beisemann, Heinz: *See*—
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,592,710, Cl. 425-141.000.

Bekele, Solomon; and Lee, Victor W., to Uniroyal Chemical Company, Inc. Antistatic thermoplastic composition comprising a graft polymer, halogenated thermoplastic polymer and conductive carbon black. 4,592,861, Cl. 252-511.000.

Bekooij, Jurrianus: *See*—
Kooymans, Petrus G.; Stachowiak, Stephen A.; Bekooij, Jurrianus; and Raudenbusch, Werner T., 4,593,078, Cl. 525-497.000.

Belart, Juan, to ITT Industries, Inc. Hydraulic brake system. 4,592,599, Cl. 303-119.000.

Belforte, Piero, to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Low-dissipation output stage for binary transmitters. 4,593,211, Cl. 307-455.000.

Bell Telephone Laboratories: *See*—
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,592,955, Cl. 428-389.000.

Bellehache, Pierre; and La Barre, Paul, to Societe de Machines pour la Transformation des Plastiques. Apparatus for manufacturing plastic bottles from molded hollow preforms. 4,592,719, Cl. 425-526.000.

Beller, Frank W., to Belson Manufacturing Co., Inc. Slant adjustable grill. 4,592,335, Cl. 126-25.00A.

Beloit Corporation: *See*—
Gorner, Bernd; and Zeyher, Heinz, 4,592,259, Cl. 83-13.000.

Belokin, Martin P., to Martin Paul, Inc. Holder for toothpicks. 4,592,486, Cl. 221-283.000.

Belson Manufacturing Co., Inc.: *See*—
Beller, Frank W., 4,592,335, Cl. 126-25.00A.

Bendl, Peter, to Feodor Burgmann Dichtungswerke GmbH & Co. Chimney coupling for a flue gas pipe. 4,592,336, Cl. 126-314.000.

Benedict, Charles R. Apparatus and method for producing and uniformly applying foamed bituminous binders to road surfaces. 4,592,507, Cl. 239-172.000.

Beniek, George S., to Eaton Corporation. Motor with improved low-speed operation. 4,592,704, Cl. 418-61.00B.

Benjamin, Loftus A.; Aikens, Donald T.; Gravestock, Thomas B.; and Soehodho, Herman, to Brunswick Mining and Smelting Corporation Ltd. Method of producing di-ammonium phosphate fertilizer. 4,592,771, Cl. 71-34.000.

Benjamin, Terrell A.: *See*—
Tubergen, Timothy S.; and Benjamin, Terrell A., 4,592,929, Cl. 427-98.000.

Bennett, Adam J.: *See*—
Capes, Charles E.; Bennett, Adam J.; Jonasson, Kevin A.; and Thayer, William L., 4,592,506, Cl. 239-139.000.

Bennett, Tommy J.: *See*—
Shih, Hung-Dah; and Bennett, Tommy J., 4,592,308, Cl. 118-726.000.

Bennwik, Percy E.: *See*—
Hjertman, Birger T.; and Bennwik, Percy E., 4,592,743, Cl. 604-82.000.

Benoist, Rene A.; Clauzel, Michel R.; and Vandenbroucke, Roger A. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation - S.N.E.C.M.A. Turbo-jet engine afterburner system. 4,592,200, Cl. 60-261.000.

Benoit, Gordon L., to Mobil Oil Corporation. Method of producing an internally reinforced thermoplastic film and film and articles produced therefrom. 4,592,938, Cl. 428-35.000.

Beranek, Mark W.: *See*—
Young, Peter L.; Oprysko, Modest M.; and Beranek, Mark W., 4,592,975, Cl. 430-5.000.

Beranek, William J., to Cordis Corporation. Pacing/sensing electrode sleeve and method of forming same. 4,592,372, Cl. 128-786.000.

Berfield, Robert C., to Shop-Vac Corporation. Spring retainer for vacuum cleaner nozzle brush. 4,592,111, Cl. 15-371.000.

Berg, Lloyd; and Yeh, An-I. Separation of n-propyl acetate from n-propanol by extractive distillation. 4,592,805, Cl. 203-51.000.

Bergeron, Paul H.; Carpenter, Kurt D.; Hickson, Jerome B., Jr.; Jackson, Roger K.; Lallier, Keith W.; and Malone, Elba K., to International Business Machines Corporation. Bay packing method and integrated circuit employing same. 4,593,362, Cl. 364-488.000.

Bergmans, Christianus H. J.: *See*—
Nooijen, Fransiscus M. J.; and Bergmans, Christianus H. J., 4,593,346, Cl. 363-21.000.

Bergwerksverband GmbH: *See*—
Ludwig, Gerhard; Simon, Jozsef; Zorkendorfer, Eckhard; Gappa, Gunther; Vaupel, Knut; and Klein, Jurgen, 4,592,837, Cl. 210-189.000.

Berkowitz, Paul R., to AT&T Information Systems Inc. Communication system power arrangement. 4,593,272, Cl. 340-500.000.

Berthiller, Franz. Method of incinerating stalks, especially of straw. 4,592,290, Cl. 110-346.000.

Berthod, Louis: *See*—
Lejeune, Pierre; and Berthod, Louis, 4,592,845, Cl. 210-715.000.

Beta Instrument Company Limited: *See*—
Kyriakis, John, 4,592,881, Cl. 264-40.100.

Bettge, Hans: *See*—
Bialkowski, Gunter; and Bettge, Hans, 4,593,164, Cl. 200-144.00B.

Bezos, Angel P.: *See*—
Fernandez, Emilio A.; Bezos, Angel P.; and Martin, Gregory C., 4,592,217, Cl. 73-129.000.

Bialkowski, Gunter; and Bettge, Hans, to Siemens Aktiengesellschaft. Housing of a vacuum switching tube. 4,593,164, Cl. 200-144.00B.

Bickley, Robert H., to Motorola, Inc. Oscillator with switched reactance resonator for wide bandwidth and serial bias connections for low power. 4,593,256, Cl. 331-117.00R.

Bielecki, Edwin J.; Mosheim, C. Edward; and Sheth, Umedray L., to Cabot Corporation. Process for producing columbium oxyfluoride. 4,592,904, Cl. 423-472.000.

Bienfait, Michel; Durand, Bernard; Suzanne, Jean; and Ungerer, Philippe, to Institut Francais du Petrole. Method and device for obtaining information relative to organic materials or minerals likely to be contained in geological formations. 4,593,195, Cl. 250-253.000.

Bigou, Alphonse: *See*—
Flork, Michel; and Bigou, Alphonse, 4,593,045, Cl. 514-562.000.

Bijlenga, Bo; Hok, Bertil; and Nilsson, Maria, to ASEA Aktiebolag. Luminescent sensor for an optical temperature-measuring device. 4,592,664, Cl. 374-131.000.

Bilciurescu, Andrei S. Strip-holder for interdental therapy. 4,592,729, Cl. 433-142.000.

Bilow, Norman: *See*—
Du Pont, Preston S.; and Bilow, Norman, 4,592,925, Cl. 427-74.000.

Biochem International Inc.: *See*—
Ricciardelli, Robert H.; and Sommer, Robert M., 4,592,368, Cl. 128-719.000.

Bird, Forrest M. Ventilator having an oscillatory inspiratory phase and method. 4,592,349, Cl. 128-204.250.

Biswas, Dipak R.; and Raychaudhuri, Satyabrata, to ITT Corporation. Hermetic coating for an optical fiber. 4,592,932, Cl. 427-163.000.

BL Cars Limited: *See*—
Stubbs, Peter W. R., 4,592,203, Cl. 60-358.000.

Black & Decker Inc.: *See*—
Cousins, Walter K.; and Secoura, Ralph A., 4,593,220, Cl. 310-239.000.
Harris, David; and Hays, Alan, 4,593,221, Cl. 310-242.000.
Judge, Alfred H., 4,592,502, Cl. 227-131.000.

Blackmore, David J., to Ab-Ag Laboratories Limited. Calf screening. 4,592,338, Cl. 128-1.00R.

Bland, Gerald F., to Outboard Marine Corporation. Water pump for marine propulsion devices. 4,592,733, Cl. 440-88.000.

Blankshain, Alan R.: *See*—
Cutler, Donald R.; and Blankshain, Alan R., 4,592,768, Cl. 62-532.000.

Blaschke, Felix, to Siemens Aktiengesellschaft. Method and apparatus for determining the flux vector of a rotating-field machine from the

stator current and the stator voltage, and the application thereof. 4,593,240, Cl. 318-800.000.

Blauschild, Robert A., to Signetics Corporation. Analog-to-digital converter using absolute-value conversion. 4,593,268, Cl. 340-347.0AD.

Blessing, Michael A.: *See—*
Bunning, Donald L.; and Blessing, Michael A., 4,593,127, Cl. 568-454.000.

Block, Gerald. Energy conserving apparatus for regulating temperature of monitored device. 4,593,258, Cl. 331-176.000.

Blom, Hendrik; Stok, Filippus L.; and Tienkamp, Engbert, to U.S. Philips Corporation. Method of adjusting the current intensity of an electron beam in a pickup tube and television camera system suitable therefor. 4,593,321, Cl. 358-219.000.

Bloomfield, Philip E., to Pennwalt Corporation. Piezoelectric polymeric film discriminating bite force occlusal indicator. 4,592,727, Cl. 433-71.000.

Blyth, Randolph C.; and Ucci, Pompelio A., to Monsanto Company. Stain-resistant nylon carpets impregnated with condensation product of formaldehyde with mixture of diphenolsulfone and phenolsulfonic acid. 4,592,940, Cl. 428-96.000.

BMD Badisch Maschinenfabrik Durlach GmbH: *See—*
Damm, Norbert, 4,592,406, Cl. 164-169.000.

Bobbola, Paolo, to Roj Electrotex S.p.A. Optical weft sensor for air jet weaving looms. 4,592,394, Cl. 139-370.100.

Bobick, Thomas W.: *See—*
Kannapell, Henry N.; and Bobick, Thomas W., 4,593,325, Cl. 358-282.000.

Bobsein, Rex L.; and Lindstrom, Merlin R., to Phillips Petroleum Company. Chain-transfer agents for emulsion polymerization and polymer products produced therewith. 4,593,081, Cl. 526-211.000.

Boden, Richard M.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,593,143, Cl. 568-665.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Kempas, Hagen, 4,592,242, Cl. 74-5.00F.

Boehringer Mannheim GmbH: *See—*
Poppe, Werner; van Rijekevorsel, Rainer; Ruppender, Uwe; and Macho, Heinz, 4,592,893, Cl. 422-56.000.
Wilhelms, Otto-Henning; Stahl, Peter; and Wunderwald, Peter, 4,592,997, Cl. 435-23.000.

Boeing Company, The: *See—*
Doubt, Roark M., 4,592,808, Cl. 204-20.000.
Herndon, Gerald F., 4,592,523, Cl. 244-122.0AG.
Nitardy, John H., 4,593,287, Cl. 343-17.500.
Thornock, Russel L., 4,592,508, Cl. 239-265.190.

Bogage, Gerald I. Waterproof fan. 4,592,702, Cl. 416-247.00R.

Bohn, Hans; and Winckler, Wilhelm, to Behringwerke Aktiengesellschaft. Protein PP_{20}, a process for obtaining it, and its use. 4,592,863, Cl. 530-350.000.

Bohnet, Klaus; and Ackeret, Peter. Magnetic tape cassette box. 4,592,600, Cl. 312-12.000.

Boiting, Hans H.; Federhen, Bernd; and Muller-Spath, Gerhard, to Alb. Klein GmbH & Co. KG. Pneumatic conveying process and apparatus. 4,592,679, Cl. 406-127.000.

Bolin, Gustav G. A. Method of improving the acoustics of a hall. 4,593,404, Cl. 381-82.000.

Bolin, Jonathan K.: *See—*
Smith, Norma W.; and Bolin, Jonathan K., 4,592,351, Cl. 128-207.170.

Boling, Norman L.: *See—*
Temple, Michael D.; Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., 4,592,939, Cl. 428-64.000.

Bollinger, Wayne C.: *See—*
Burnett, Arthur P.; and Bollinger, Wayne C., 4,592,890, Cl. 420-442.000.

Bon, Charles K.; Kamp, Arthur J.; and Sobieralski, Theodore J., to Dow Chemical Company, The. Electrocatalytic production of 2,3,5,6-tetrachloropyridine from pentachloropyridine. 4,592,810, Cl. 204-59.00R.

Bonded Products, Inc.: *See—*
Busch, Fred A., 4,592,690, Cl. 413-19.000.

Boord, Ronald: *See—*
Hutchins, Alma A.; Hutchins, Donald H.; and Boord, Ronald, 4,592,170, Cl. 51-170.0MT.

Boots Company PLC, The: *See—*
Stenzenberger, Horst D., 4,593,083, Cl. 526-262.000.

Borea, Giorgio; and Pantaleoni, Nerio, to Borea, Giorgio. Toothbrush with a device for the perfect orientation of the bristles with respect to the surface of the teeth. 4,592,109, Cl. 15-172.000.

Borel, Georg, to Hermann Wangner - GmbH & Co. KG. Papermachine clothing in a fabric weave having no axis of symmetry in the length direction. 4,592,395, Cl. 139-383.00A.

Borel, Georg; and Jonsson, Bengt, to Hermann Wangner-GmbH & Co. KG. Multi-layer clothing for papermaking machines. 4,592,396, Cl. 139-425.00A.

Borer, Werner; Lukacs, Janos; and Spalinger, Hugo, to Swiss Aluminium Ltd. Device for rounding off granular particles of solid material. 4,592,707, Cl. 425-7.000.

Borgman, Robert J.: *See—*
Erhardt, Paul W.; and Borgman, Robert J., 4,593,119, Cl. 560-42.000.

Borman, Willem F. H.; Craft, Donald I.; and Kramer, Morton, to General Electric Company. Process of making a high melt viscosity block copolyester. 4,593,077, Cl. 525-444.000.

Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, to Reanal Finomvegyszergyar. Process for the immobilization of cyclodextrine glycosyltransferase enzyme. 4,593,004, Cl. 435-181.000.

Bosque, Raul A. Combination ratchet and spinner wrench. 4,592,256, Cl. 81-57.290.

Boswell, Robert F., Jr.: *See—*
Munson, Harry R., Jr.; and Boswell, Robert F., Jr., 4,593,034, Cl. 514-305.000.

Bottemiller, Donald L., to Homecrest Industries Incorporated. Method for constructing furniture having a flexible sheet portion. 4,592,126, Cl. 29-446.000.

Bouboulis, Constantine J.; and Kuntz, Irving, to Exxon Research & Engineering Co. Superior solvent blends for synthesis of acrylic resins for high solids coatings. 4,593,080, Cl. 526-208.000.

Bourassa, Ronald R., to Inmos Corporation. Method for fabricating integrated circuits with polysilicon resistors. 4,592,128, Cl. 29-571.000.

Boutarin, Jacques. Insulated wall panels. 4,592,179, Cl. 52-172.000.

Bouvier, Marlene: *See—*
St-Pierre, Leon E.; Brown, G. Ronald; Henning, Dominique S.; and Bouvier, Marlene, 4,593,073, Cl. 525-328.400.

Bowls, Thurman A., to General Electric Company. Printed circuit card frame assembly. 4,592,610, Cl. 339-65.000.

Bowman, Kenneth A., to Aluminum Company of America. Method of segregating metallic components and removing fines therefrom. 4,592,511, Cl. 241-14.000.

Bowser, George H.; Pysewski, Stanley J.; and Chiesuzzi, Renato, to PPG Industries, Inc. Electrical conduit with integral moisture-vapor barrier. 4,593,175, Cl. 219-203.000.

Boyd, Richard M., to Minnesota Rubber Company. Flow washer. 4,592,390, Cl. 138-45.000.

Boyer, David A.: *See—*
Nelson, Erik K.; O'Connor, Joseph G.; Boyer, David A.; and Saccocio, Edward J., 4,592,986, Cl. 430-98.000.

Boyer, Richard M., to Signetics Corporation. Switching circuit with active pull-off. 4,593,210, Cl. 307-443.000.

Boyles, Paul W. Artificial catheter means. 4,592,340, Cl. 128-1.00D.

Bradford, Joseph. Sports game. 4,592,555, Cl. 273-402.000.

Braginetz, Paul A., to Fishburne, B. P., Jr.; and Wilson, Marlin G. Heavy duty anchor for deck boards and the like. 4,592,186, Cl. 52-699.000.

Brand, Jessica J.: *See—*
Jagger, Janine C.; Pearson, Richard D.; Guyenet, Patrice G.; and Brand, Jessica J., 4,592,744, Cl. 604-192.000.

Brandt, Incorporated: *See—*
Bryce, David; and Sherman, William, III, 4,593,184, Cl. 235-449.000.

Brant, Benjamin: *See—*
Wrobel, Albert A., 4,592,317, Cl. 123-198.00B.

Brattesani, Donald N.: *See—*
Kyriacou, Demetrios; and Brattesani, Donald N., 4,592,811, Cl. 204-73.00R.

Braun, Karl; and Fetzer, Jurgen, to Intermedicat GmbH. Surgical stapler. 4,592,498, Cl. 227-19.000.

Breezer, Harlan W.: *See—*
Dresen, William L.; Price, William F.; Emery, Phillip L.; and Breezer, Harlan W., 4,592,583, Cl. 296-39.00R.

Breitman, Daniel S.; and Dueck, Ernest G., to Pratt & Whitney Canada Inc. Inertial separator. 4,592,765, Cl. 55-306.000.

Bridgeford, Douglas J., to Teepak, Inc. Non-edible, reinforced amylose and amylose starch food casings. 4,592,795, Cl. 156-203.000.

Bridges, Paul D.: *See—*
Dean, James; and Bridges, Paul D., 4,592,563, Cl. 280-253.000.

Brilliant, Herbert. Diagnostic mirror and light filter. 4,592,726, Cl. 433-31.000.

Bristol, James A.; Moos, Walter; and Trivedi, Bharat K., to Warner-Lambert Company. N^6-tricyclic adenosines. 4,593,019, Cl. 514-46.000.

Bristol, L. Rodney; Hillman, Alfred K., Jr.; and Law, William Q., to Tektronix, Inc. Control circuit for a delayed sweep oscilloscope. 4,593,242, Cl. 324-121.00R.

Bristow, Duncan J.; Achia, Biddanda U.; and Evers, Lawrence J., to Exxon Research and Engineering Co. Process for increasing Bright Stock raffinate oil production. 4,592,832, Cl. 208-309.000.

British Petroleum Company P.L.C., The: *See—*
Gregory, Reginald, 4,593,135, Cl. 585-446.000.

Brodbeck, Howard D.; and Krongold, Martin A., to MG Industries. Low pressure cryogenic liquid delivery system. 4,592,205, Cl. 62-49.000.

Brodrene Gram A/S: *See—*
Gram, Klaus, 4,592,709, Cl. 425-126.00S.

Bromine Compounds, Ltd.: *See—*
Teuerstein, Avraham; Scharia, Rubin; and Sprecher, Milon, 4,592,873, Cl. 558-59.000.

Bromley, Jonathan S. E.; Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., to National Research Development Corp. Electronic apparatus for automatic control of the placing of material at a junction between surfaces. 4,593,173, Cl. 219-124.340.

Brooks, David L. Easy reach coffee filters and optional reusable storage container. 4,592,840, Cl. 210-493.500.

Brooks Rand, Ltd.: *See—*
Beck, Theodore R.; and Brooks, Richard J., 4,592,812, Cl. 204-67.000.

Brooks, Richard J.: *See—*
Beck, Theodore R.; and Brooks, Richard J., 4,592,812, Cl. 204-67.000.

Bross, Elly, to Stanbel, Inc. Bakeware organizer. 4,592,471, Cl. 211-41.000.
Bross, Robert. Handgun magazine with pommel base. 4,592,160, Cl. 42-7.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Asano, Satoru; and Abe, Shigeru, 4,592,297, Cl. 112-443.000.
Brown, Alfred: *See*—
Long, Stephen L.; and Brown, Alfred, 4,592,424, Cl. 166-263.000.
Brown, G. Ronald: *See*—
St-Pierre, Leon E.; Brown, G. Ronald; Henning, Dominique S.; and Bouvier, Marlene, 4,593,073, Cl. 525-328.400.
Brown Group, Inc.: *See*—
Wright, Robert L.; and Zeuschel, Donald W., 4,592,152, Cl. 36-11.500.
Brown, Thomas I. H.: *See*—
Davis, Graham R.; and Brown, Thomas I. H., 4,592,369, Cl. 128-733.000.
Bruce, Clarence A.; Koh, Yoong G.; Matwey, Paul; Maiman, Mitchell H.; Chan, Wing C.; and DeFreest, Thomas J., to NCR Corporation. Cathode ray tube mounting means. 4,593,227, Cl. 313-482.000.
Bruninga, Kenneth J.; and Fletcher, Douglas C., to L. R. Nelson Corporation. Quick disconnect mounted programming means for sprinkler. 4,592,505, Cl. 239-69.000.
Bruno, John J.: *See*—
Venuti, Michael C.; and Bruno, John J., 4,593,029, Cl. 514-267.000.
Bruns, Robert F.: *See*—
Snyder, Solomon H.; Daly, John W.; and Bruns, Robert F., 4,593,095, Cl. 544-272.000.
Brunswick Mining and Smelting Corporation Ltd.: *See*—
Benjamin, Loftus A.; Aikens, Donald T.; Gravestock, Thomas B.; and Soehodho, Herman, 4,592,771, Cl. 71-34.000.
Bryant, David R.: *See*—
Abatjoglou, Anthony G.; and Bryant, David R., 4,593,011, Cl. 502-161.000.
Bryce, David; and Sherman, William, III, to Brandt, Incorporated. Counterfeit detection circuit. 4,593,184, Cl. 235-449.000.
Bubak, John, to Massey-Ferguson Inc. Clutch and transmission brake assembly. 4,592,455, Cl. 192-13.00R.
Buchel, Karl H.: *See*—
Kraatz, Udo; Reiser, Wolf; Buchel, Karl H.; and Lurssen, Klaus, 4,592,772, Cl. 71-76.000.
Bucher-Guyer AG: *See*—
Amstutz, Jean-Pierre, 4,592,194, Cl. 56-16.400.
Buma, Shuuichi: *See*—
Yokoya, Yuji; Buma, Shuuichi; and Araki, Hitoshi, 4,592,540, Cl. 267-8.00R.
Bunning, Donald L.; and Blessing, Michael A., to Union Carbide Corporation. Hydroformylation process. 4,593,127, Cl. 568-454.000.
Buono, Gerard: *See*—
Mortreux, Andre ; Petit, Francis; Denis, Philippe; Buono, Gerard; and Peiffer, Gilbert, 4,593,140, Cl. 585-508.000.
Buran, Ulrich; Fischer, Manfred; and Neuhauser, Hans-Jochem, to Goetze AG. Wear-resistant coating. 4,592,964, Cl. 428-610.000.
Burkel, Rainer; and Taubitz, Bernd, to Robert Bosch GmbH. Electric control motor. 4,593,222, Cl. 310-254.000.
Burkholder, Richard A.; Gilson, Richard W.; and Walker, Clarence L., to Sherwood Medical Company. Syringe and locking device and method of assembling same. 4,592,746, Cl. 604-220.000.
Burnett, Arthur P.; and Bollinger, Wayne C., to Dentsply Research & Development Corp. Dental prostheses alloy. 4,592,890, Cl. 420-442.000.
Burnett, Ralph G. Shipping container seal. 4,592,579, Cl. 292-327.000.
Burr-Brown Corporation: *See*—
Korn, Thomas H., 4,593,252, Cl. 330-260.000.
White, Robert, 4,593,270, Cl. 340-347.0AD.
Burroughs Corporation: *See*—
Grow, Robert M., 4,593,280, Cl. 340-825.050.
Koos, William M., Jr.; Geis, Timothy R.; and Rudy, Richard M., Jr., 4,593,278, Cl. 340-748.000.
Temple, Michael D.; Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., 4,592,939, Cl. 428-64.000.
Burstein, Michael; Hong, Se J.; and Pelavin, Richard N., to International Business Machines Corporation. Simultaneous placement and wiring for VLSI chips. 4,593,363, Cl. 364-491.000.
Burth, Ulrich: *See*—
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.
Burton, Ian S.: *See*—
Hall, Raymond J.; and Burton, Ian S., 4,592,430, Cl. 173-12.000.
Burzynski, Stanislaw R. Topical use of 3-phenylacetylamino-2,6-piperidinedione for treatment of skin wrinkles and hyperpigmentation. 4,593,038, Cl. 514-328.000.
Busch, Fred A., to Bonded Products, Inc. Hot melt gasketing compositions and processes for applying them. 4,592,690, Cl. 413-19.000.
Busta, Heinz H., to Gould Inc. Laser-recrystallized diaphragm pressure sensor and method of making. 4,592,238, Cl. 73-727.000.
Butefisch, Karl-Aloys; and Ahlbrecht, Horst, to Deutsche Forschungs- und Versuchsanstalt fur Lutf- und Raumfahrt EV. Device for measuring pressures and variations of pressure with time. 4,592,229, Cl. 73-147.000.
Butter, Stephen A.; and Stoll, Ilse, to Air Products and Chemicals, Inc. Synthesis of neoalkanes. 4,593,147, Cl. 585-733.000.
Butternut Electronics Co.: *See*—
Newcomb, Donald R., 4,593,289, Cl. 343-795.000.
Byington, Robert G.: *See*—
Osman, Robert M.; and Byington, Robert G., 4,592,903, Cl. 423-359.000.
Caber Italia S.p.A.: *See*—
Sartor, Leo, 4,592,567, Cl. 280-602.000.
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Bielecki, Edwin J.; Mosheim, C. Edward; and Sheth, Umedray L., 4,592,904, Cl. 423-472.000.
Cadars, Patrick, to Valeo. Degassing device for a fluid circulating in a heat exchanger. 4,592,418, Cl. 165-104.320.
Cadee, Theodorus P. M., to Van Doorne'S Transmissie B.V. Infinitely variable V-belt transmission for a motor vehicle. 4,592,457, Cl. 192-0.076.
Caggiano, Michael A., to Texaco Inc. Smoke filter with frangible supported filter bed. 4,592,899, Cl. 422-180.000.
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., to Societe Nationale des Poudres et Explosifs. Process for the synthesis of α-chlorinated chloroformates. 4,592,872, Cl. 558-281.000.
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Cahalan, Patrick T.: *See*—
Jevne, Allan H.; Vegoe, Brett R.; Holmblad, Carolann M.; and Cahalan, Patrick T., 4,593,053, Cl. 523-111.000.
Cale, Albert D., Jr., to A. H. Robins Company, Inc. Fused aromatic oxazepinones, thiazepinones, diazepinones and sulfur analogs thereof. 4,592,866, Cl. 260-239.30T.
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Castel, Rene; Calvignac, Jean-Louis; and Draper, Wilburn D., 4,593,352, Cl. 364-200.000.
Campbell, Henry F., to William H. Rorer, Inc. 5-hetero aryl-substituted-2-pyridones useful as cardiotonic agents for treatment of congestive heart failure. 4,593,028, Cl. 514-256.000.
Campbell, Michael E., to General Electric Company. Tool pre-gauging device. 4,592,146, Cl. 33-185.00R.
Canadian Fram Limited: *See*—
Mason, Murray R., 4,592,251, Cl. 74-785.000.
Canadian Patents and Development Limited: *See*—
Capes, Charles E.; Bennett, Adam J.; Jonasson, Kevin A.; and Thayer, William L., 4,592,506, Cl. 239-139.000.
Golob, Theodore B.; Gilles, Wim; Jasinski, Stan K.; and Whitehead, Patrick B. G., 4,592,398, Cl. 144-3.00D.
Cancian, Annamaria C.; and Shimalla, Charles J., to Chicopee. Open mesh belt bonded fabric. 4,592,943, Cl. 428-171.000.
Candy, James C., to AT&T Bell Laboratories. Higher order interpolation for digital-to-analog conversion. 4,593,271, Cl. 340-347.0DA.
Canon Kabushiki Kaisha: *See*—
Kaneda, Naoya; and Matsuda, Kazuya, 4,592,638, Cl. 354-403.000.
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,592,636, Cl. 354-225.000.
Matsufuji, Yohji; and Ichihashi, Hiroo, 4,593,295, Cl. 346-140.00R.
Mitsuhashi, Yasuo; Takenouchi, Masanori; Okado, Kenji; Imai, Eiichi; and Suematsu, Koshi, 4,592,987, Cl. 430-102.000.
Nishigaki, Yuji, 4,592,984, Cl. 430-59.000.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,592,985, Cl. 430-84.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,979, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,981, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,982, Cl. 430-57.000.
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Suda, Shigeyuki, 4,592,637, Cl. 354-403.000.
Suzuki, Koji; Nagahira, Jyoji; and Kuroda, Kouki, 4,592,646, Cl. 355-14.00R.
Takagi, Seiichi; Hyosu, Yoshihiko; and Sasakawa, Masumi, 4,592,990, Cl. 430-137.000.
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, 4,592,980, Cl. 430-57.000.
Yanagi, Michio, 4,593,333, Cl. 360-125.000.
Capes, Charles E.; Bennett, Adam J.; Jonasson, Kevin A.; and Thayer, William L., to Canadian Patents and Development Limited. Wear resistant atomizing nozzle assembly. 4,592,506, Cl. 239-139.000.
Cappa, Giulio; and Moscatelli, Romano, to Sekur S.p.A. Commutator feeding device for a demand valve intended for introducing breathable air into a compressed air breathing apparatus. 4,592,384, Cl. 137-494.000.
Capy, Gilbert. Apparatus for fabricating plastic parts. 4,592,711, Cl. 425-144.000.
Cargle, Virgil H., to Exxon Research & Engineering Co. Method for soil stabilization and fugitive dust control. 4,592,931, Cl. 427-136.000.
Cari-All Inc.: *See*—
Trubiano, Antoine, 4,592,286, Cl. 108-108.000.
Carlsen, William C.: *See*—
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.
Carlson, Carl. Tool for finishing taped dry wall joints. 4,592,797, Cl. 156-574.000.

Carnera, Umberto E. Portable, lightweight clothesline assembly. 4,592,472, Cl. 211-119.010.
Caro, Wayne H.: *See—*
Banta, Ira C.; and Caro, Wayne H., 4,593,178, Cl. 219-315.000.
Carpenter, Kurt D.: *See—*
Bergeron, Paul H.; Carpenter, Kurt D.; Hickson, Jerome B., Jr.; Jackson, Roger K.; Lallier, Keith W.; and Malone, Elba K., 4,593,362, Cl. 364-488.000.
Carrasquel, Angel R.: *See—*
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Carstens, Jerry E.: *See—*
Feist, Barry R.; Carstens, Jerry E.; and Peterson, David A., 4,592,708, Cl. 425-80.100.
Carswell, William R.: *See—*
Friedman, Evelyn; and Carswell, William R., 4,592,461, Cl. 194-227.000.
Carternock, Frederick A., to Pulsar International Limited. Material working machines. 4,592,696, Cl. 414-685.000.
Casanova, Giuseppe; and De Zolt, Ivano, to Costan S.p.A. Display counter for food products, refrigerated by forced ventilation. 4,592,209, Cl. 62-255.000.
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., to Imperial Chemical Industries Plc. Catalytic isomerisation process employing zeolite EU-1. 4,593,138, Cl. 585-481.000.
Case, Michael A.: *See—*
Mattison, Glenn D.; and Case, Michael A., 4,592,416, Cl. 165-83.000.
Casey, Donald J.; and Trzaskos, William J., to American Cyanamid Company. Synthesis of 10-hydroxymethyl-9-anthraldehyde. 4,593,130, Cl. 568-427.000.
Casley-Smith, John R. Benzo-pyrones as a treatment for schizophrenia. 4,593,041, Cl. 514-457.000.
Caslin, Richard L.: *See—*
Gaither, John L., 4,592,469, Cl. 206-494.000.
Castel, Rene; Calvignac, Jean-Louis; and Draper, Wilburn D., to International Business Machines Corp. Method and device for exchanging information between terminals and a central control unit. 4,593,352, Cl. 364-200.000.
Castelain, Jean-Pierre. Continuous method for manufacturing thermic lances. 4,592,503, Cl. 228-147.000.
Castle Technology Corp.: *See—*
Pemsler, J. Paul; and Dempsey, Michael D., 4,592,973, Cl. 429-206.000.
Castner, Kenneth F., to Goodyear Tire & Rubber Company, The. Injection water viscosifier for enhanced oil recovery. 4,592,850, Cl. 252-8.55D.
Cavil, David T.; and Krueger, William R., to Outboard Marine Corporation. Cathodic protection system. 4,592,818, Cl. 204-196.000.
CDP, Ltd.: *See—*
Ecer, Gunes M., 4,592,252, Cl. 76-108.00A.
Celanese Corporation: *See—*
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Central Glass Co., Ltd.: *See—*
Kita, Yasushi; Nakano, Hishaji; Moroi, Shiro; and Sakanoue, Akira, 4,593,132, Cl. 570-150.000.
Miyaji, Kiyoshi; Moriyama, Katutoshi; and Oka, Yoshifumi, 4,592,261, Cl. 83-102.100.
Centre Suisse d'Electronique et de Microtechnique S.A.: *See—*
Smith, Rosemary L.; and Collins, Scott, 4,592,824, Cl. 204-416.000.
Cepeda Associates, Inc.: *See—*
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Chaffy, Joseph: *See—*
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Champion Spark Plug Europe S.A.: *See—*
Verton, Jose , 4,592,110, Cl. 15-250.350.
Chamuel, Jacques R., to Charles Stark Draper Laboratory, The. Fiber optic sensor lead fiber noise cancellation. 4,593,385, Cl. 367-149.000.
Chan, Wing C.: *See—*
Bruce, Clarence A.; Koh, Yoong G.; Matwey, Paul; Maiman, Mitchell H.; Chan, Wing C.; and DeFreest, Thomas J., 4,593,227, Cl. 313-482.000.
Chandra, Grish; and Lo, Peter Y. K., to Doe Corning Corporation. Platinum-phosphine-vinylsiloxane complexes. 4,593,084, Cl. 528-15.000.
Chane Hwa Electrical Co. Ltd.: *See—*
Tong, George K. K., 4,592,613, Cl. 339-147.00P.
Chane Hwa Manufacturing Co. Ltd.: *See—*
Tong, George K. K., 4,592,613, Cl. 339-147.00P.
Channell, Glenn L. Scissor frame lift apparatus for dump trucks. 4,592,593, Cl. 298-22.00J.
Charbonnier, Simon. Device for making cabled yarns of improved regularity. 4,592,195, Cl. 57-58.360.
Charchanko, Eugene W.; Kuhfus, Gerd; and Dragunevicius, Algirdas J., to Northern Telecom Limited. Base plate for telephone set base. 4,593,159, Cl. 179-100.00R.
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., to Northern Telecom Limited. Apparatus for sealably encapsulating articles. 4,592,721, Cl. 425-558.000.
Charles Stark Draper Laboratory, The: *See—*
Chamuel, Jacques R., 4,593,385, Cl. 367-149.000.
Chase, Mark T.; and Middleton, Michael C., to Honeywell Information Systems Inc. Power sequencer. 4,593,349, Cl. 364-200.000.
Chase, Richard C., to American Science and Engineering, Inc. Method of quick back projection for computed tomography and improved CT machine employing the method. 4,593,355, Cl. 364-414.000.
Chasen, Lee R., to Coats & Clark, Inc. Combination food peeler and slicer. 4,592,140, Cl. 30-123.700.
Chechovsky, Dardis W.; and Rikard, Jackie D. Tank closure lock. 4,592,218, Cl. 70-164.000.
Chemical Decontamination Corporation: *See—*
Layman, Robert G.; and Kemp, Linwood B., 4,592,844, Cl. 210-709.000.
Chen, Charles C., to Thomson Components - Mostek Corporation. Resilient stopper for integrated circuit magazine. 4,592,481, Cl. 220-307.000.
Cheney, Richard F.; and Pierce, Richard H., to GTE Products Corporation. Method for making ultrafine metal powder. 4,592,781, Cl. 75-249.000.
Cherniavsky, Margaret: *See—*
Fraenkel, Dan; Levy, Moshe; and Cherniavsky, Margaret, 4,593,137, Cl. 585-467.000.
Chevalier, Jean. Electromechanical preparation of photoengraving cylinders. 4,593,326, Cl. 358-299.000.
Chevron Research Company: *See—*
Vaughan, Ronald J., deceased; and Bank of America NT&SA, administrator, 4,592,814, Cl. 204-78.000.
Chiao, Yi-Shong. Electrostatic engine oil cleaner. 4,592,836, Cl. 210-168.000.
Chiba, Jiro: *See—*
Takabatake, Mitsuo; Chiba, Jiro; and Kokubu, Yoshinori, 4,593,006, Cl. 501-32.000.
Chiba, Shu: *See—*
Akiyama, Junichi; Chiba, Shu; and Sawazaki, Norikazu, 4,593,332, Cl. 360-111.000.
Chicago Bridge & Iron Company: *See—*
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Chimicasa GmbH: *See—*
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Chisso Corporation: *See—*
Sugimori, Shigeru; and Goto, Yasuyuki, 4,592,857, Cl. 252-299.610.
Chiu, Herman S., to Union Carbide Corporation. Tar-depleted aqueous liquid smoke composition. 4,592,918, Cl. 426-533.000.
Chlanda, Frederick P.; and Mani, Krishnamurthy N., to Allied Corporation. Electrodialytic water splitting process for gaseous products. 4,592,817, Cl. 204-182.400.
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., to AT&T Technologies, Inc.; and Bell Telephone Laboratories. Insulating covering for strand material. 4,592,955, Cl. 428-389.000.
Chollet, Gerard, to Fraco S.A. Device for emptying recipients containing products of high viscosity. 4,592,491, Cl. 222-146.500.
Christensen, Harold B. Rope securing device. 4,592,116, Cl. 24-132.00R.
Christensen, Jorgen A.: *See—*
Lassen, Jorgen B.; Christensen, Jorgen A.; Petersen, Erling N.; and Hansen, John B., 4,593,036, Cl. 514-317.000.
Christiansen, Joseph R. Ship's-vessel's rudder with reduced drag effected factors. 4,592,299, Cl. 114-162.000.
Christophe, Theophile; and Moatti, Jean-Claude, to Georges Moatti. Filter incorporating two distinct filtering stacks. 4,592,838, Cl. 210-323.100.
Christopher, Todd J.: *See—*
Willis, Donald H.; and Christopher, Todd J., 4,593,315, Cl. 358-140.000.
Chrysler Corporation: *See—*
Durand, Remie P., 4,592,615, Cl. 339-176.00L.
Chu, Chin-Chiun, to Mobil Oil Corporation. Process for para-ethyltoluene dehydrogenation. 4,593,134, Cl. 585-445.000.
Chu, Yung F.; and Shih, Stuart S., to Mobil Oil Corporation. Process for upgrading petroleum residua. 4,592,828, Cl. 208-89.000.
Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., to Tapco Products Company, Inc. Coil holder. 4,592,518, Cl. 242-78.700.
Chupp, John P.; and Neumann, Thomas E., to Monsanto Company. Process for preparing substituted benzotrichloride compounds. 4,593,144, Cl. 568-936.000.
Ciba-Geigy Corporation: *See—*
Irving, Edward, 4,593,052, Cl. 522-31.000.
Clar, Georges: *See—*
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Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., to International Business Machines Corporation. Method for providing a top seal coating on a substrate containing an electrically conductive pattern and coated article. 4,592,944, Cl. 428-195.000.
Claunch, Carney P., II: *See—*
Jensen, Michael L.; and Claunch, Carney P., II, 4,593,181, Cl. 219-541.000.
Clauzel, Michel R.: *See—*
Benoist, Rene A.; Clauzel, Michel R.; and Vandenbroucke, Roger A. J., 4,592,200, Cl. 60-261.000.

Claxton, Raymond J. Material entrainment and circulation impeller and method for submerging and entraining material in a media. 4,592,658, Cl. 366-265.000.
Clayton, Alan M.: *See—*
Robbins, Eric J.; Clayton, Alan M.; White, William P.; and Leckenby, Robert E., 4,592,662, Cl. 374-57.000.
Clayton, James W., deceased: *See—*
Lee, William W. Y.; Shaw, Gareth L.; Clayton, James W., deceased; and Bachino, Denise, administrator, 4,592,132, Cl. 29-590.000.
Cliffe, Steven: *See—*
Austen, Brian M.; Cliffe, Steven; Grant, David; and Hermon-Taylor, John, 4,593,018, Cl. 514-16.000.
Clifford, Mark J.; Hock, Robert H.; Jagunich, Douglas M.; and Robinson, Paul J., to Medtronic, Inc. Analog and digital signal transmitter. 4,593,284, Cl. 340-870.180.
Clocksin, William F.: *See—*
Bromley, Jonathan S. E.; Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,593,173, Cl. 219-124.340.
CMT Costruzioni Meccaniche e Tecnologie S.p.A.: *See—*
Tomatis, Stefano, 4,592,274, Cl. 99-452.000.
Coats & Clark, Inc.: *See—*
Chasen, Lee R., 4,592,140, Cl. 30-123.700.
Coburn, Ronald L., to International Business Machines Corp. VCO centering circuit. 4,593,254, Cl. 331-1.00A.
Coca-Cola Company, The: *See—*
McMichael, Dannie L., 4,592,490, Cl. 222-129.100.
Cocks, Eric H. Fluid spray control system. 4,593,360, Cl. 364-468.000.
Coe, Frederick L.: *See—*
Kuzmak, Lubomyr I.; and Coe, Frederick L., 4,592,339, Cl. 128-1.00R.
Coetzer, Johan; and Nolte, Margaretha, to Lilliwyte Societe Anonyme. Electrochemical cell. 4,592,969, Cl. 429-50.000.
Coggins, Dolphus L.: *See—*
Lindner, Walter E.; and Coggins, Dolphus L., 4,592,854, Cl. 252-79.300.
Cohen, Robert E.; Corbin, George C.; and Baddour, Raymond F., to Massachusetts Institute of Technology. Ultraviolet light assisted fluorination of polymer surfaces. 4,593,050, Cl. 522-2.000.
Colato, Albert E., to Plastics, Inc. Microwave oven turntable shelf structure and method. 4,593,171, Cl. 219-10.55M.
Colbert, James J. Endodontic film holder. 4,593,401, Cl. 378-168.000.
Colegrove, George T.; and Lindroth, Thomas A., to Merck & Co., Inc. Coal slurry. 4,592,760, Cl. 44-51.000.
Collard, Andre; and Collard, Michel. Multi-purpose, all terrain vehicle. 4,592,439, Cl. 180-140.000.
Collard, Michel: *See—*
Collard, Andre; and Collard, Michel, 4,592,439, Cl. 180-140.000.
Collins, Scott: *See—*
Smith, Rosemary L.; and Collins, Scott, 4,592,824, Cl. 204-416.000.
Combi Door Australia Pty. Ltd.: *See—*
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Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.
Kazandjoglou, Jourdain, 4,593,275, Cl. 340-604.000.
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Stewart, Derwent G.; and Fisher, Samuel A., 4,592,202, Cl. 60-264.000.
Communate Europeenne de l'Energie Atomique (Euratom): *See—*
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.
Compair Power Tools Limited: *See—*
Hall, Raymond J.; and Burton, Ian S., 4,592,430, Cl. 173-12.000.
Compton, Brian: *See—*
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Computer Basic Technology Research Association: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.
Conroy, Gary M.: *See—*
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Contraves AG: *See—*
Kuster, Manfred; and Weiss, Paul, 4,592,602, Cl. 312-223.000.
Corbet, Jean-Pierre: *See—*
Arnaud, Michel; and Corbet, Jean-Pierre, 4,593,101, Cl. 546-153.000.
Corbin, George C.: *See—*
Cohen, Robert E.; Corbin, George C.; and Baddour, Raymond F., 4,593,050, Cl. 522-2.000.
Corboy, John F., Jr.; and Jastrzebski, Lubomir L., to RCA Corporation. Method for forming uniformly thick selective epitaxial silicon. 4,592,792, Cl. 148-175.000.
Cordier, Bernard, to Fives-Cail Babcock. Automatic shirt cuff manufacturing unit. 4,592,295, Cl. 112-65.000.
Cordis Corporation: *See—*
Beranek, William J., 4,592,372, Cl. 128-786.000.
Lesnick, Alan F., 4,592,360, Cl. 128-419.0PG.
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, to Ruhrchemie Aktiengesellschaft. Process for preparing aldehydes. 4,593,126, Cl. 568-454.000.
Corning Glass Works: *See—*
Herczog, Andrew, 4,593,341, Cl. 361-310.000.
Cornu, Bernard; and Lion, Rene , to Novatome. Device for emergency removal of the heat dissipated by a fast breeder nuclear reactor when shut down. 4,592,888, Cl. 376-299.000.
Costan S.p.A.: *See—*
Casanova, Giuseppe; and De Zolt, Ivano, 4,592,209, Cl. 62-255.000.
Courduvelis, Constantine I.; and Del Gobbo, Anthony R., to Enthone, Incorporated. Composition and process for treating plastics with alkaline permanganate solutions. 4,592,852, Cl. 252-79.100.
Cousins, Steven J.; Jones, Keith N.; and Ackerley, Kenneth E., to University College London. Shapeable matrix, and a chair using a matrix. 4,592,587, Cl. 297-284.000.
Cousins, Walter K.; and Secoura, Ralph A., to Black & Decker Inc. Brush bearing sub-assembly for electric motor. 4,593,220, Cl. 310-239.000.
Craft, Donald I.: *See—*
Borman, Willem F. H.; Craft, Donald I.; and Kramer, Morton, 4,593,077, Cl. 525-444.000.
Crevoiserat, Teresa. Probe for measuring oxygen partial pressure in a gas atmosphere. 4,592,825, Cl. 204-426.000.
Crites, Robert C.; and Youngs, Wilbur R., to Crites, Robert C. Method and apparatus for attaching furring to columns. 4,592,187, Cl. 52-741.000.
Cross, Rodney C.: *See—*
Summers, Warwick R.; and Cross, Rodney C., 4,593,244, Cl. 324-230.000.
Crossley, Roger, to John Wyeth & Brother Ltd. Silyl isothiocyanates. 4,593,111, Cl. 556-410.000.
Crowell, Christopher S., to Structural Graphics, Inc. Three-dimensional pop-up message display stationery. 4,592,573, Cl. 283-56.000.
Cselt - Centro Studi e Laboratori Telecommunicazioni S.p.A.: *See—*
Belforte, Piero, 4,593,211, Cl. 307-455.000.
Culbertson, E. C.: *See—*
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Cunningham, William P.: *See—*
Pearman, William O.; Hunt, Joseph L.; and Cunningham, William P., 4,592,770, Cl. 65-128.000.
Curley, Richard D. Paper drill bit sharpener. 4,592,171, Cl. 51-246.000.
Cutler, Donald R.; and Blankshain, Alan R., to Chicago Bridge & Iron Company. Apparatus and process for desalination combining freeze concentration, centrifugation, and reverse osmosis. 4,592,768, Cl. 62-532.000.
Cutler, George D., to Tekflo Limited. Flowmeter. 4,592,239, Cl. 73-861.660.
Daby, Larry E.: *See—*
Anderson, Nathaniel C.; Daby, Larry E.; Johnson, Gene A.; and McCaffrey, Patrick M., 4,593,334, Cl. 360-126.000.
Dagna, Giandomenico, to Ing. C. Olivetti & C., S.p.A. Ink jet printer with gas evacuating arrangement. 4,593,296, Cl. 346-140.00R.
Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., to Bayer Aktiengesellschaft. Microcapsules having walls of polyaddition products of water-insoluble polyamines with water-soluble polyisocyanate adducts. 4,592,957, Cl. 428-402.210.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Naka, Akihiro; Mayuzumi, Tominobu; and Sugiyama, Hiroshi, 4,592,759, Cl. 44-51.000.
Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Ohtsuka, Hiroo; and Ohtsuki, Tomonari, 4,592,608, Cl. 339-42.000.
Daiken Trade & Industry Co., Ltd.: *See—*
Aoki, Eiichi; and Kobayashi, Hideyuki, 4,592,962, Cl. 428-541.000.
Daikin Industries, Ltd.: *See—*
Hizukuri, Susumu, 4,593,005, Cl. 435-203.000.
Daikuzono, Norio, to Surgical Laser Technologies Ohio, Inc. Medical and surgical laser probe. 4,592,353, Cl. 128-303.100.
Daimler-Benz Aktiengesellschaft: *See—*
Baumann, Karl-Heinz; Mang, Uli; and Schwede, Wolfgang, 4,592,571, Cl. 280-756.000.
Dainippon Pharmaceutical Co., Ltd.: *See—*
Hayano, Seiki; Yokogawa, Kanae; and Kurooka, Shigeru, 4,592,995, Cl. 435-7.000.
Dainippon Screen Manufacturing Co., Ltd.: *See—*
Henmi, Kojiro; and Miyasaka, Eiji, 4,592,652, Cl. 355-76.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Mitsuka, Ikuo, 4,593,377, Cl. 364-900.000.
Dall'Osso, Gastone: *See—*
Mattei, Riccardo; and Dall'Osso, Gastone, 4,592,470, Cl. 209-535.000.
Daly, John W.: *See—*
Snyder, Solomon H.; Daly, John W.; and Bruns, Robert F., 4,593,095, Cl. 544-272.000.
Dambkes, Georg: *See—*
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, 4,593,126, Cl. 568-454.000.
Dambrackas, William A.: *See—*
Baugh, Charles R.; Hilpert, Edwin J.; Kushin, George R.; Park, Yoon B.; and Dambrackas, William A., 4,593,399, Cl. 375-104.000.
Damm, Norbert, to BMD Badisch Maschinenfabrik Durlach GmbH. Apparatus for compacting foundry sand. 4,592,406, Cl. 164-169.000.

Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, to Hoechst Aktiengesellschaft. Device for making alkali metal phosphates by spraying alkali metal phosphate solutions or suspensions. 4,592,803, Cl. 159-4.020.

Dana Corporation: *See—*
Nieman, Andrew L.; and Gall, Ray A., 4,592,556, Cl. 277-27.000.

Danby, Hal C.: *See—*
Lee, John J.; Avila, Arthur F.; Danby, Hal C.; and Beigler, Myron A., 4,592,370, Cl. 128-746.000.

Darden, Jerome W.; and McEntire, Edward E., to Texaco Inc. Dicyclopentadiene dicarboxylic acid salts as corrosion inhibitors. 4,592,853, Cl. 252-75.000.

d'Argembeau, Etienne Y. Brushes and the manufacture thereof. 4,592,594, Cl. 300-21.000.

Daroczi, Ivan: *See—*
Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, 4,593,004, Cl. 435-181.000.

Darr, Robert E.: *See—*
Mojden, Wallace W.; and Darr, Robert E., 4,592,462, Cl. 198-464.200.

Data General Corporation: *See—*
Gershenson, Edward, 4,593,375, Cl. 364-900.000.

Datatape, Inc.: *See—*
Grant, Frederic F., 4,592,522, Cl. 242-193.000.

Daugherty, Robert W., to Dayton Band, Inc. Guitar strap hook. 4,592,266, Cl. 84-327.000.

Daum, William K. Connector plate for fabricating buildings. 4,592,671, Cl. 403-171.000.

Dausseing, Jean-Paul: *See—*
Fish, Aaron M.; Dausseing, Jean-Paul; and Mayzels, Leon, 4,592,453, Cl. 192-0.02R.

Davan Industries: *See—*
Vanistendael, David M., 4,592,682, Cl. 408-241.00R.

Davenport, Kenneth G.; and Linstid, H. Clay, III, to Celanese Corporation. Acylation of naphthalenes. 4,593,125, Cl. 568-319.000.

Davey, Peter G.: *See—*
Bromley, Jonathan S. E.; Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,593,173, Cl. 219-124.340.

Davies, Glyndwr J., to AE PLC. Composition of matter incorporating polyether ether ketone. 4,592,782, Cl. 75-253.000.

Davies, Idwal; and Fage, John L., to Mixalloy Limited. Production of flat products in strip sheet or like form. 4,592,780, Cl. 75-229.000.

Davis, Dennis R. Periodontal lavage delivery system. 4,592,728, Cl. 433-80.000.

Davis, Earl K.; Drye, James E.; and Reed, David J., to Motorola, Inc. Glass bonding method. 4,592,794, Cl. 156-89.000.

Davis, Graham R.; and Brown, Thomas I. H., to National Research Development Corp. Method and apparatus for use in temporal analysis of waveforms. 4,592,369, Cl. 128-733.000.

Davis Walker Corporation: *See—*
Ghizzi, Mario, 4,592,784, Cl. 134-15.000.

Day, Frank S.: *See—*
Drew, Thomas J.; and Day, Frank S., 4,592,616, Cl. 339-177.00R.

Day, Paul L.: *See—*
Pfaffmann, George D.; and Day, Paul L., 4,592,537, Cl. 266-78.000.

Dayton Band, Inc.: *See—*
Daugherty, Robert W., 4,592,266, Cl. 84-327.000.

Deal, James F.: *See—*
Williams, Joseph L.; Sansing, John W.; Hayes, Michael E.; and Deal, James F., 4,592,786, Cl. 134-22.180.

Dean, Barry D., to Atlantic Richfield Company. Impact resistant polyamide molding compositions. 4,593,066, Cl. 525-66.000.

Dean, Barry D., to Atlantic Richfield Company. Elastomer having random peroxide functionality and method. 4,593,074, Cl. 525-331.700.

Dean, James; and Bridges, Paul D. Recreational vehicle. 4,592,563, Cl. 280-253.000.

Dedegil, Mehmet: *See—*
Weber, Manfred; and Dedegil, Mehmet, 4,592,226, Cl. 73-59.000.

Deere & Company: *See—*
Holm, David R.; and Wubben, Carl A., 4,592,437, Cl. 180-68.600.
Jackson, Robert C.; and Luchsinger, Patrick M., 4,592,716, Cl. 425-330.000.

DeFreest, Thomas J.: *See—*
Bruce, Clarence A.; Koh, Yoong G.; Matwey, Paul; Maiman, Mitchell H.; Chan, Wing C.; and DeFreest, Thomas J., 4,593,227, Cl. 313-482.000.

Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, to Nisshin Steel Co., Ltd. Surface treatment of high-nickel/iron alloy steel plate for LNG or LPG tanks. 4,592,965, Cl. 428-621.000.

Degussa Aktiengesellschaft: *See—*
Behr, Norbert; von Ettingshausen, Othmar; Wust, Reinhold; and van der Mei, Henk, deceased, 4,592,911, Cl. 424-195.100.

Deie, Toshikazu, to Kabushiki Kaisha Toshiba. Method for manufacturing resin-sealed semiconductor device. 4,592,131, Cl. 29-588.000.

Deininger, Rolf: *See—*
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,592,910, Cl. 424-195.100.

Deleonibus, Simon; and Dubois, Guy, to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux E.F.C.I.S. Method of fabrication of aluminum contacts through a thick insulating layer in an integrated circuit. 4,592,802, Cl. 156-644.000.

DelGiorno, Daniel: *See—*
Pellicano, Russell A.; and DelGiorno, Daniel, 4,592,371, Cl. 128-774.000.

Del Gobbo, Anthony R.: *See—*
Courduvelis, Constantine I.; and Del Gobbo, Anthony R., 4,592,852, Cl. 252-79.100.

della Valle, Francesco; and Romeo, Aurelio, to Fidia, S.p.A. Method for preparing ganglioside derivatives and use thereof in pharmaceutical compositions. 4,593,091, Cl. 536-53.000.

Dempsey, Michael D.: *See—*
Pemsler, J. Paul; and Dempsey, Michael D., 4,592,973, Cl. 429-206.000.

Denenberg, Jeffrey N.: *See—*
Slack, Thomas B.; and Denenberg, Jeffrey N., 4,593,367, Cl. 364-513.000.

Denis, Philippe: *See—*
Mortreux, Andre ; Petit, Francis; Denis, Philippe; Buono, Gerard; and Peiffer, Gilbert, 4,593,140, Cl. 585-508.000.

Denis, Rene : *See—*
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.

Dennesen, Joseph C.; and Wilson, Richard S. Drive for stencilling apparatus. 4,592,277, Cl. 101-38.00R.

Dennis, Mahlon D., to Strata Bit Corporation. Cutting blank with diamond strips in grooves. 4,592,433, Cl. 175-329.000.

Dennison Manufacturing Company: *See—*
Shuman, Ralph J., 4,592,946, Cl. 428-200.000.

deNora, Oronzio, to Oronzio deNora Impianti Elettrochimici S.p.A. Electrolysis cell. 4,592,822, Cl. 204-252.000.

Dentsply Research & Development Corp.: *See—*
Burnett, Arthur P.; and Bollinger, Wayne C., 4,592,890, Cl. 420-442.000.

Derde, Jan F.: *See—*
Vandeweghe, Michel; and Derde, Jan F., 4,592,392, Cl. 139-1.00E.

Derks, Christopher S.: *See—*
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.

DeRoche, Robert J.: *See—*
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.

Desblache, Andre ; Galand, Claude; and Vermot-Gauchy, Robert, to International Business Machines Corp. Method of initializing a filter in an echo canceller and communication system using said method. 4,593,161, Cl. 179-170.200.

Design Pak, Incorporated: *See—*
Stein, Edmund W. E., 4,592,465, Cl. 206-0.830.

Deutsche Forschungs- und Versuchsanstalt fur Lutf- und Raumfahrt EV: *See—*
Butefisch, Karl-Aloys; and Ahlbrecht, Horst, 4,592,229, Cl. 73-147.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Gembus, Hans-Dieter, 4,593,201, Cl. 250-517.100.
Halm, Horst, 4,592,258, Cl. 81-57.400.
Kaufmann, Friedrich, 4,592,898, Cl. 422-159.000.

Devito, Joseph P.: *See—*
Tendrup, Donald L.; and Devito, Joseph P., 4,592,166, Cl. 47-67.000.

DeVries, James H.: *See—*
Ebling, Wendell V.; and DeVries, James H., 4,592,749, Cl. 604-283.000.

DeVries, Vern G.: *See—*
Floyd, Middleton B., Jr.; and DeVries, Vern G., 4,592,876, Cl. 260-511.000.

de Wied, David, to Akzo N.V. Methods of treating patients using a pharmaceutical preparation containing an α-endorfine fragment. 4,593,017, Cl. 514-16.000.

DeWitt, Paolo: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and DeWitt, Paolo, 4,593,043, Cl. 514-547.000.

de Witte, Paul: *See—*
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,592,803, Cl. 159-4.020.

DeWoskin, Irvin S., to Barnhart Industries, Inc. Fasteners for apparel and methods of manufacturing them. 4,592,118, Cl. 24-444.000.

De Zolt, Ivano: *See—*
Casanova, Giuseppe; and De Zolt, Ivano, 4,592,209, Cl. 62-255.000.

Dhainaut, Alain: *See—*
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; Duhault, Jacques; and Roman, Francois, 4,593,026, Cl. 514-245.000.

Dhont, Andre G. J., to Sperry Corporation. Torque sensing drive. 4,592,737, Cl. 474-19.000.

Dickinson, Norman L., to DIPAC Associates. Combination of supercritical wet combustion and compressed air energy storage. 4,593,202, Cl. 290-54.000.

Diederichs, Hanns-Juergen, Jr., to NICO-PYROTECHNIK Hanns-Juergen Diederichs GmbH Co. KG. Device for signaling. 4,592,159, Cl. 42-1.00Z.

Diesel Kiki Co., Ltd.: *See—*
Fujimori, Kyoichi; and Ichikawa, Takeo, 4,592,327, Cl. 123-502.000.

Dietch, Leonard; and Palac, Kazimir, to Zenith Electronics Corporation. Tension mask colar cathode ray tube. 4,593,225, Cl. 313-407.000.
Dietrich, William J., Sr.; Knobloch, Dean A.; and Sizelove, Cary L., Sr., to DMI, Inc. Knife applicator for dry and liquid fertilizer. 4,592,294, Cl. 111-7.000.
Dietz, Peter W.; and Peters, Philip H., to General Electric Company. Method and apparatus for ramped pulsed burst powering of electrostatic precipitators. 4,592,763, Cl. 55-2.000.
Digital Scintigraphics, Inc.: *See*—
Pang, Sing C.; and Genna, Sebastian, 4,593,198, Cl. 250-366.000.
Dimeff, John: *See*—
Fox, Lowell J.; and Dimeff, John, 4,593,259, Cl. 333-22.00F.
DIPAC Associates: *See*—
Dickinson, Norman L., 4,593,202, Cl. 290-54.000.
Ditto, James W.: *See*—
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.
DMI, Inc.: *See*—
Dietrich, William J., Sr.; Knobloch, Dean A.; and Sizelove, Cary L., Sr., 4,592,294, Cl. 111-7.000.
Dobbie Instruments (Australia) Pty. Ltd.: *See*—
Wilson, Bruce L., 4,592,661, Cl. 374-10.000.
Dr. Ing.-H.c.F. Porsche Aktiengesellschaft: *See*—
Lehmann, Ulrich; and Weigele, Hans, 4,592,249, Cl. 74-473.00R.
Doe Corning Corporation: *See*—
Chandra, Grish; and Lo, Peter Y. K., 4,593,084, Cl. 528-15.000.
Doi, Muneharu: *See*—
Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, 4,593,000, Cl. 435-88.000.
Dombek, Bernard D., to Union Carbide Corporation. Production of methyl esters and ethylene glycol esters from reaction of carbon monoxide and hydrogen in presence of ruthenium catalyst. 4,592,870, Cl. 260-410.600.
Dombroski, John R.; and Jenkins, Waylon L., to Eastman Kodak Company. Process for producing high molecular weight vinyl copolymers. 4,593,082, Cl. 526-216.000.
Doubt, Roark M., to Boeing Company, The. Method for plating conductive plastics. 4,592,808, Cl. 204-20.000.
Douji, Ryuhachirou: *See*—
Uno, Shinichi; Suzuki, Etsuji; Douji, Ryuhachirou; and Inoue, Mituji, 4,593,309, Cl. 358-10.000.
Dow Chemical Company, The: *See*—
Bon, Charles K.; Kamp, Arthur J.; and Sobieralski, Theodore J., 4,592,810, Cl. 204-59.00R.
Johnson, M. Anthony, 4,592,787, Cl. 134-38.000.
Johnson, Mark R., 4,593,103, Cl. 548-239.000.
Jones, Mary Ann; and Arends, Charles B., 4,593,063, Cl. 524-505.000.
Kyriacou, Demetrios; and Brattesani, Donald N., 4,592,811, Cl. 204-73.00R.
Schmidt, Donald L.; and Harris, Robert F., 4,592,930, Cl. 427-133.000.
Dow Corning Corporation: *See*—
Antonen, Robert C., 4,592,928, Cl. 427-93.000.
Bauman, Therese M.; Lee, Chi-Long; and Rabe, James A., 4,593,049, Cl. 521-99.000.
Dowa Mining Co., Ltd.: *See*—
Takeda, Ryuzo; Ooyama, Shigeru; and Ishibashi, Yukio, 4,592,974, Cl. 429-229.000.
Dragunevicius, Algirdas J.: *See*—
Charchanko, Eugene W.; Kuhfus, Gerd; and Dragunevicius, Algirdas J., 4,593,159, Cl. 179-100.00R.
Draper, Wilburn D.: *See*—
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Dresen, William L.; Price, William F.; Emery, Phillip L.; and Breezer, Harlan W., to Penda Corporation. Truck cargo bed liner. 4,592,583, Cl. 296-39.00R.
Dresser Industries, Inc.: *See*—
Maierbacher, Joseph, 4,592,699, Cl. 415-126.000.
Malik, Dev R., 4,592,667, Cl. 384-593.000.
Pennison, Robert A.; and Eckman, Richard E., 4,592,681, Cl. 408-10.000.
Dressler, Hans; Holter, Samuel N.; and Znidarsic, Nancy, to Koppers Company, Inc. Rust preventives. 4,592,783, Cl. 106-14.050.
Drew, Thomas J.; and Day, Frank S., to Armex Cable Corporation. Connector for coaxial television cable. 4,592,616, Cl. 339-177.00R.
Drijver, Jan: *See*—
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,592,803, Cl. 159-4.020.
Drobish, James L.; and McKibben, Gary E., to Procter & Gamble Company, The. Easy open/reclose device for flexible packages. 4,593,408, Cl. 383-43.000.
Droho, Joseph S.: *See*—
Wisbey, Robert W.; and Droho, Joseph S., 4,593,231, Cl. 315-100.000.
Drye, James E.: *See*—
Davis, Earl K.; Drye, James E.; and Reed, David J., 4,592,794, Cl. 156-89.000.
Dubois, Guy: *See*—
Deleonibus, Simon; and Dubois, Guy, 4,592,802, Cl. 156-644.000.
Dubuit, Jean Louis M. Printing machine with curing system. 4,592,276, Cl. 101-38.00A.
Dueck, Ernest G.: *See*—
Breitman, Daniel S.; and Dueck, Ernest G., 4,592,765, Cl. 55-306.000.
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., to Adolph Coors Company. Device for reheating and blow molding parisons. 4,592,720, Cl. 425-526.000.
Duhault, Jacques: *See*—
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; Duhault, Jacques; and Roman, Francois, 4,593,026, Cl. 514-245.000.
Dulbecco, Renato, to Salk Institute Biotechnology/Industrial Associates, Inc. Viruses with recombinant surface proteins. 4,593,002, Cl. 435-172.300.
Du Pont de Nemours, E. I., and Company: *See*—
Levitt, George, 4,592,978, Cl. 544-321.000.
Sauers, Richard F., 4,592,775, Cl. 71-90.000.
Weigert, Frank J., 4,593,124, Cl. 564-409.000.
Du Pont, Preston S.; and Bilow, Norman, to Hughes Aircraft Company. Polyimide composition and method for protecting photoreactive cells. 4,592,925, Cl. 427-74.000.
Dupray, Dominique: *See*—
Fourcade, Pierre; and Dupray, Dominique, 4,593,379, Cl. 364-900.000.
Durand, Bernard: *See*—
Bienfait, Michel; Durand, Bernard; Suzanne, Jean; and Ungerer, Philippe, 4,593,195, Cl. 250-253.000.
Durand, Remie P., to Chrysler Corporation. Folded redundant terminal. 4,592,615, Cl. 339-176.00L.
Durckheimer, Walter: *See*—
Winklemann, Erhardt; Durckheimer, Walter; and Raether, Wolfgang, 4,593,027, Cl. 514-253.000.
Durr, Manfred; Unland, Georg; Wurr, Jurgen; and Vering, Antonius, to Krupp Polysius AG. Grate cooler and method of cooling. 4,592,724, Cl. 432-78.000.
Durr, Paul, to Hilti Aktiengesellschaft. Hand-held screw driving device with adjustable depth stop. 4,592,257, Cl. 81-429.000.
Dusa, Donald J.; Kuchar, Andrew P.; and Faust, Guy K., to General Electric Company. Turbofan mixed flow exhaust system. 4,592,201, Cl. 60-262.000.
Dustin, Terry C., to Masco Building Products Corp. Convertible ventilation system for oven. 4,592,333, Cl. 126-21.00R.
Dutton, Fred E.; and Nelson, Stephen J., to Upjohn Company, The. N-imidoylthio(methyl)carbamates. 4,592,871, Cl. 558-2.000.
Dyck, Rudolph H.; and Early, James M., to Fairchild Camera & Instrument Corporation. Self-aligned antiblooming structure for charge-coupled devices. 4,593,303, Cl. 357-24.000.
E. R. Squibb & Sons, Inc.: *See*—
Gegelys, Anthony A., 4,592,751, Cl. 604-368.000.
Eagle, Leo. Apparatus for detecting an overturning moment in a moving vehicle, and jackknifing in a trailer-truck combination. 4,592,565, Cl. 280-432.000.
Earl, Geoffrey H.: *See*—
Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., 4,592,988, Cl. 430-107.000.
Early, James M.: *See*—
Dyck, Rudolph H.; and Early, James M., 4,593,303, Cl. 357-24.000.
Eastman Kodak Company: *See*—
Dombroski, John R.; and Jenkins, Waylon L., 4,593,082, Cl. 526-216.000.
Gourley, Robert N., 4,593,087, Cl. 534-784.000.
Gourley, Robert N., 4,593,088, Cl. 534-768.000.
Eaton Corporation: *See*—
Beniek, George S., 4,592,704, Cl. 418-61.00B.
Ebara Corporation: *See*—
Toguchi, Seiichi; and Kobayashi, Makoto, 4,592,700, Cl. 415-213.00A.
Eberly, Paul E., Jr., to Exxon Research and Engineering Co. Desulfurization of hydrocarbons. 4,592,829, Cl. 208-89.000.
Ebling, Wendell V.; and DeVries, James H., to Gish Biomedical, Inc. Catheter system. 4,592,749, Cl. 604-283.000.
Ebner, Cynthia L.: *See*—
Goldwasser, Judah M.; Adolph, Horst G.; and Ebner, Cynthia L., 4,593,110, Cl. 549-347.000.
Ebonite International, Inc.: *See*—
Lee, Andrew J., 4,592,551, Cl. 273-63.00E.
Ecer, Gunes M., to CDP, Ltd. Rolling cutters for drill bits, and processes to produce same. 4,592,252, Cl. 76-108.00A.
Echlin Inc.: *See*—
Sloan, Carroll D., 4,593,209, Cl. 307-419.000.
Eck, Leonard F., to Hein-Werner Corporation. Vehicle repair and alignment rack. 4,592,225, Cl. 72-457.000.
Eckman, Richard E.: *See*—
Pennison, Robert A.; and Eckman, Richard E., 4,592,681, Cl. 408-10.000.
Economy, James: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,592,944, Cl. 428-195.000.
Edi System s.r.l.: *See*—
Guglielmi, Mauro; Pighetti, Antonio; Vezzani, Savino; and Acerbi, Sergio, 4,592,533, Cl. 251-30.010.
EerNisse, Errol P.; and Wiggins, Robert B., to Quartex, Inc. Resonator temperature transducer. 4,592,663, Cl. 374-117.000.
Eertink, Bastiaan B. B.: *See*—
Roelofs, Johannes C. H.; Eertink, Bastiaan B. B.; and Geurts, Petrus A. M., 4,592,641, Cl. 355-3.0TR.

Efrom, Harriet. Clothes drying rack and accompanying receptacle. 4,592,473, Cl. 211-205.000.

Egan, Daniel J.: *See—*
Egan, Peggy S.; and Egan, Daniel J., 4,592,145, Cl. 30-507.000.

Egan, Michael J.; and Quill, Gary J., to Williams International Corporation. Method for manufacturing a multiple property integral turbine wheel. 4,592,120, Cl. 29-156.80R.

Egan, Peggy S.; and Egan, Daniel J. Hacksaw hand guard. 4,592,145, Cl. 30-507.000.

Egli, Gordon J. Drawing table. 4,592,285, Cl. 108-9.000.

Egli, Werner H., to Honeywell, Inc. Ring laser angular rate sensor with modulated scattered waves. 4,592,656, Cl. 356-350.000.

Egusa, Tomoyoshi; and Yamauchi, Yutaka, to NTN Toyo Bearing Co., Ltd. Method of machining tapered roller bearing inner rings. 4,592,172, Cl. 51-291.000.

Ehrreich, John E., to Ercon, Inc. Particle filled flexible coating composition of aromatic polyester and vinylidene chloride copolymer. 4,592,961, Cl. 428-480.000.

Eicken, Karl; Rohr, Wolfgang; Zeeh, Bernd; and Wurzer, Bruno, to BASF Aktiengesellschaft. 2-halo-N-(azole-1-yl-methyl)-substituted acetanilides. 4,593,104, Cl. 548-262.000.

Elan Corporation P.L.C.: *See—*
Panoz, Donald E., 4,592,753, Cl. 604-897.000.

Elastogran Maschinenbau GmbH: *See—*
Taubenmann, Peter, 4,592,657, Cl. 366-134.000.

Electro-Voice, Incorporated: *See—*
Frye, Kent; and Ewald, Gary T., 4,593,405, Cl. 381-99.000.

Electrochemical Technology Corp.: *See—*
Beck, Theodore R.; and Brooks, Richard J., 4,592,812, Cl. 204-67.000.

Elkem Metals Company: *See—*
Wells, James E., III, 4,592,538, Cl. 266-216.000.

Ellis, Chris P.: *See—*
Ellis, John P.; and Ellis, Chris P., 4,592,494, Cl. 222-252.000.

Ellis, John P.; and Ellis, Chris P. Sealed barrier container. 4,592,494, Cl. 222-252.000.

Emery, Phillip L.: *See—*
Dresen, William L.; Price, William F.; Emery, Phillip L.; and Breezer, Harlan W., 4,592,583, Cl. 296-39.00R.

Emhart Industries, Inc.: *See—*
Nebelung, Hermann H., 4,592,715, Cl. 425-308.000.

Emi Limited: *See—*
Sansom, David J., 4,593,336, Cl. 360-131.000.

Emmons, Keith, to Reef Industries, Inc. Reinforced laminate of co-extruded film. 4,592,941, Cl. 428-113.000.

Emmons, William D.; and Winkle, Mark R., to Rohm and Haas Company. Electrophoretic deposition process. 4,592,816, Cl. 204-180.600.

Endo, Takeshi: *See—*
Ohnishi, Yoshitake; and Endo, Takeshi, 4,592,993, Cl. 430-313.000.

Energy Conversion Devices, Inc.: *See—*
Yaniv, Zvi; and Johnson, Robert R., 4,593,199, Cl. 250-484.100.
Yu, Terry T.; and Yen, Mei-Rong, 4,592,867, Cl. 260-351.100.

Eng, Kai Y.; Haskell, Barin G.; and Schmidt, Robert L., to AT&T Bell Laboratories. Technique for the time compression multiplexing of three television signals. 4,593,318, Cl. 358-142.000.

Engineering Resources, Inc.: *See—*
Troy, Michael, 4,592,381, Cl. 137-203.000.

Engle, Edgar R. Trailer hitch signaling device. 4,593,264, Cl. 340-52.00R.

ENICHIMICA, S.p.A.: *See—*
Russo, Saverio; Alfonso, Giovanni C.; Turturro, Antonio; and Pedemonte, Enrico, 4,593,076, Cl. 525-425.000.

Enomoto, Yuji: *See—*
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.

Enthone, Incorporated: *See—*
Courduvelis, Constantine I.; and Del Gobbo, Anthony R., 4,592,852, Cl. 252-79.100.

Ercon, Inc.: *See—*
Ehrreich, John E., 4,592,961, Cl. 428-480.000.

Erhardt, Paul W.; and Borgman, Robert J., to American Hospital Supply Corporation. Method for treatment or prophylaxis of cardiac disorders. 4,593,119, Cl. 560-42.000.

Erico Products, Inc.: *See—*
Kramer, James W., 4,592,688, Cl. 411-349.000.

Ersek, Robert A. Septal splint. 4,592,357, Cl. 128-342.000.

Esposito, Augustine G.: *See—*
Klievoneit, Harold R.; and Esposito, Augustine G., 4,592,169, Cl. 51-118.000.

Etablissement Declare d'Utilite Publique Dit: Institut Pasteur: *See—*
Avrameas, Stratis; and Ternynck, Therese M. F., 4,592,998, Cl. 435-28.000.

Ethyl Corporation: *See—*
Bauer, Beverly A., 4,593,118, Cl. 560-41.000.
Penton, Harold R.; Kucsma, Michael E.; and Pettigrew, F. Alexander, 4,592,755, Cl. 623-8.000.
Wilson, R. Woodrow, Jr.; and Thomas, Dustin H., 4,593,129, Cl. 568-716.000.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,592,761, Cl. 44-57.000.

Eulenberg, Hannspeter; and Larue, Horst, to Kernforschungsanlage Julich GmbH. Hall generator circuit with temperature compensation. 4,593,241, Cl. 323-294.000.

Evans, Albert D.: *See—*
Grieder, Max; Evans, Albert D.; and Weibel, Hans, 4,592,835, Cl. 210-107.000.

Evans, William J.: *See—*
Winer, Steven; and Evans, William J., 4,592,909, Cl. 424-127.000.

Everest & Jennings: *See—*
Nassiri, Joe-Massoud, 4,592,570, Cl. 280-650.000.

Evers, Lawrence J.: *See—*
Bristow, Duncan J.; Achia, Biddanda U.; and Evers, Lawrence J., 4,592,832, Cl. 208-309.000.

Ewald, Gary T.: *See—*
Frye, Kent; and Ewald, Gary T., 4,593,405, Cl. 381-99.000.

Exxon Printing Systems, Inc.: *See—*
Parisi, Joseph P., 4,593,294, Cl. 346-140.00R.

Exxon Research and Engineering Co.: *See—*
Barthomeuf, Denise M., 4,593,149, Cl. 585-828.000.
Barthomeuf, Denise M., 4,593,150, Cl. 585-828.000.
Bouboulis, Constantine J.; and Kuntz, Irving, 4,593,080, Cl. 526-208.000.
Bristow, Duncan J.; Achia, Biddanda U.; and Evers, Lawrence J., 4,592,832, Cl. 208-309.000.
Cargle, Virgil H., 4,592,931, Cl. 427-136.000.
Eberly, Paul E., Jr., 4,592,829, Cl. 208-89.000.
Halluin, Albert P.; and Barnett, Allan E., 4,593,014, Cl. 502-242.000.
Howkins, Stuart D., 4,593,291, Cl. 346-1.100.
Jacobson, Allan J.; Johnson, Jack W.; and Lewandowski, Joseph T., 4,593,013, Cl. 502-167.000.
Lewis, Arthur M., 4,593,292, Cl. 346-1.100.
Malpass, Dennis B., 4,593,010, Cl. 502-115.000.
Osman, Robert M.; and Byington, Robert G., 4,592,903, Cl. 423-359.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,593,141, Cl. 568-454.000.
Puydak, Robert C.; and Hazelton, Donald R., 4,593,062, Cl. 524-426.000.
Stadtmiller, William H.; and Morris, Kenneth G., 4,592,851, Cl. 252-32.70E.
Wortel, Theodorus M., 4,593,133, Cl. 585-415.000.

EZ Loader Boat Trailers, Inc.: *See—*
Johnson, Lawrence N., 4,592,694, Cl. 414-534.000.

F. L. Smidth & Co. A/S: *See—*
Hundebol, Soren, 4,592,900, Cl. 423-167.000.

Fag Kugelfischer Georg Schafer & Co.: *See—*
Spielmann, Norbert; Gussbacher, Udo; Walter, Wolfgang; Bauer, Hermann; and Porzel, Rainer, 4,592,438, Cl. 180-89.100.

Fage, John L.: *See—*
Davies, Idwal; and Fage, John L., 4,592,780, Cl. 75-229.000.

Fairchild Camera & Instrument Corporation: *See—*
Dyck, Rudolph H.; and Early, James M., 4,593,303, Cl. 357-24.000.

Farrar, Grover L.; and Culbertson, E. C., to American Hoechst Corporation. Polyester film primed with crosslinked vinyl acetate polymers. 4,592,953, Cl. 428-332.000.

Fascenda, Anthony C.; and Lockton, David B., to Lockton, David B. Game of skill playable by remote participants in conjunction with a live event. 4,592,546, Cl. 273-1.00E.

Fasick, Ernest J.: *See—*
Wilson, Barri L.; Fasick, Ernest J.; King, James H.; and Leitzman, Noel E., 4,592,442, Cl. 180-247.000.

Faust, Guy K.: *See—*
Dusa, Donald J.; Kuchar, Andrew P.; and Faust, Guy K., 4,592,201, Cl. 60-262.000.

Federhen, Bernd: *See—*
Boiting, Hans H.; Federhen, Bernd; and Muller-Spath, Gerhard, 4,592,679, Cl. 406-127.000.

Feist, Barry R.; Carstens, Jerry E.; and Peterson, David A., to Procter & Gamble Company, The. Apparatus for making airlaid articles. 4,592,708, Cl. 425-80.100.

Fekete, Gyorgy: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Feldstein, Joel G.: *See—*
Ayres, Paul S.; Stark, Louis E.; Feldstein, Joel G.; and Fu, Tzerong, 4,592,577, Cl. 285-287.000.

Felser Forest Products, Inc.: *See—*
Felser, Theodore P., 4,592,182, Cl. 52-233.000.

Felser, Theodore P., to Felser Forest Products, Inc. Cornering system for buildings. 4,592,182, Cl. 52-233.000.

Feodor Burgmann Dichtungswerke GmbH & Co.: *See—*
Bendl, Peter, 4,592,336, Cl. 126-314.000.

Ferguson, Arthur R., to Outboard Marine Corporation. Marine propulsion device power steering system. 4,592,732, Cl. 440-61.000.

Ferguson, Daryl A. Ornamental article with internal display bracket. 4,592,936, Cl. 428-11.000.

Fernandez, Emilio A.; Bezos, Angel P.; and Martin, Gregory C., to Pulse Electronics, Inc. Marker attachment for railroad equipment. 4,592,217, Cl. 73-129.000.

Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,592,245, Cl. 74-89.210.

Fetzer, Jurgen: *See—*
Braun, Karl; and Fetzer, Jurgen, 4,592,498, Cl. 227-19.000.

Fichtel & Sachs AG: *See—*
Kittel, Friedrich, 4,592,460, Cl. 192-106.200.
Neugebauer, Dieter, 4,592,456, Cl. 192-58.00B.

Weissenberger, Helmuth; and Werner, Karl-Heinz, 4,592,459, Cl. 192-106.200.
Fidia, S.p.A.: *See*—
della Valle, Francesco; and Romeo, Aurelio, 4,593,091, Cl. 536-53.000.
Figueroa, Luis: *See*—
Slayman, Charles W.; and Figueroa, Luis, 4,593,304, Cl. 357-30.000.
Fikentscher, Rolf; Mertens, Heinrich; and Reincke, Klaus, to BASF Aktiengesellschaft. Production of dyed or undyed wool with an antifelting finish: quaternized piperazine condensate. 4,592,757, Cl. 8-567.000.
Fikentscher, Rolf; Mertens, Heinrich; Reincke, Klaus; and Vescia, Michele, to BASF Aktiengesellschaft. After-treatment of dyed textile materials of natural polyamides or nylons with quaternized piperazine condensate. 4,592,758, Cl. 8-567.000.
Fink, Lawrence E. Optical accelerometer. 4,592,235, Cl. 73-517.00R.
Finot, Jean-Marie, to Groupe Finot. Propulsion system for sailing crafts and ships. 4,592,298, Cl. 114-39.000.
Firey, Joseph C. Crossed pulse engine atomizer. 4,592,328, Cl. 123-531.000.
Fischer, Manfred: *See*—
Buran, Ulrich; Fischer, Manfred; and Neuhauser, Hans-Jochem, 4,592,964, Cl. 428-610.000.
Fischer & Porter: *See*—
Mannherz, Elmer D., 4,592,886, Cl. 264-262.000.
Fish, Aaron M.; Dausseing, Jean-Paul; and Mayzels, Leon, to Ilco Unican Inc. Lock actuator assembly. 4,592,453, Cl. 192-0.02R.
Fishburne, B. P., Jr.: *See*—
Braginetz, Paul A., 4,592,186, Cl. 52-699.000.
Fisher, Lynn E., to General Electric Company. Electric motors and method of manufacturing and operating same. 4,593,163, Cl. 200-80.00R.
Fisher, Samuel A.: *See*—
Stewart, Derwent G.; and Fisher, Samuel A., 4,592,202, Cl. 60-264.000.
Fitzpatrick, Roger S., to Marconi Avionics Limited. Airborne early warning system with retractable radome. 4,593,288, Cl. 343-705.000.
Fives-Cail Babcock: *See*—
Cordier, Bernard, 4,592,295, Cl. 112-65.000.
Fizner Automazione di Renzi Ferdinando G.: *See*—
Renzi, Ferdinando G., 4,592,267, Cl. 92-128.000.
Flandera, Mary A.: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,592,944, Cl. 428-195.000.
Fleetwood Systems, Inc.: *See*—
Mojden, Wallace W.; and Darr, Robert E., 4,592,462, Cl. 198-464.200.
Fletcher, Douglas C.: *See*—
Bruninga, Kenneth J.; and Fletcher, Douglas C., 4,592,505, Cl. 239-69.000.
Flork, Michel; and Bigou, Alphonse, to Societe a Responsabilite Limite dite: B.F.B. Estudes et Recherches Experimentales. N-acetyl-L-aspartyl taurine useful as hypertensive agent. 4,593,045, Cl. 514-562.000.
Floyd, Middleton B., Jr.; and DeVries, Vern G., to American Cyanamid Company. Arylglyoxals. 4,592,876, Cl. 260-511.000.
FMC Corporation: *See*—
Rathe, Robert A., 4,592,474, Cl. 212-267.000.
Focke & Co.: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,592,374, Cl. 131-282.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Process and apparatus for forming groups of cigarettes. 4,592,374, Cl. 131-282.000.
Fong, Jaan J.; and Becking, Donald H., to MacDermid, Incorporated. Electroplating composition and process and surfactant compound for use therein. 4,592,809, Cl. 204-44.200.
Ford Motor Company: *See*—
Hartsock, Dale L., 4,592,268, Cl. 92-212.000.
Plasencia, David B.; and Maxwell, Stewart P., 4,592,250, Cl. 74-688.000.
Forsheda AB: *See*—
Jornhagen, Lennart, 4,592,666, Cl. 384-477.000.
Forster, Helmut; Heinzelmann, Karl-Georg; Siebold, Horst; and Vetter, Jurgen, to Siemens Aktiengesellschaft. Device for cooling a magnet system. 4,593,261, Cl. 335-300.000.
Foster, L. Dale; and Peck, William H., to Hill-Rom Company, Inc. Hospital bed. 4,592,104, Cl. 5-66.000.
Foster-Miller, Inc.: *See*—
Harvey, Andrew C., 4,592,559, Cl. 277-214.000.
Foster, William R.: *See*—
Slattery, Peter F.; Foster, William R.; McLintock, Gavin A.; and Fraser, James K., 4,593,192, Cl. 250-229.000.
Fourcade, Pierre; and Dupray, Dominique, to Thomson-CSF. Method and a device for synchronization of messages. 4,593,379, Cl. 364-900.000.
Fox, Lowell J.; and Dimeff, John, to Varian Associates, Inc. Waveguide load having reflecting structure for diverting microwaves into absorbing fluid. 4,593,259, Cl. 333-22.00F.
Foxboro Company, The: *See*—
McHale, Edward J.; and Mattar, Wade M., 4,592,240, Cl. 73-861.220.
Fraco S.A.: *See*—
Chollet, Gerard, 4,592,491, Cl. 222-146.500.
Fraenkel, Dan; Levy, Moshe; and Cherniavsky, Margaret, to Yeda Research and Development Co., Ltd. Para-selective and beta-selective crystallized glass zeolite alkylation catalyst. 4,593,137, Cl. 585-467.000.
Framatome & Cie: *See*—
Lebouc, Bernard; and Clar, Georges, 4,592,691, Cl. 414-4.000.
Frank, Edgar H.; and Komplin, Steven R., to International Business Machines Corporation. Angular motion paper feed release system. 4,592,670, Cl. 400-637.600.
Frankl, Gerald P. Method and apparatus for recovery of useful feed values from animal waste. 4,592,275, Cl. 99-495.000.
Franz, Volker; and Geissen, Rolf, to Metallgesellschaft Aktiengesellschaft. Method of periodically heating a product separator of a plant for producing phthalic anhydride or maleic anhydride. 4,592,412, Cl. 165-2.000.
Fraser, James K.: *See*—
Slattery, Peter F.; Foster, William R.; McLintock, Gavin A.; and Fraser, James K., 4,593,192, Cl. 250-229.000.
Freeman, Jerry, to UNR Lighting. Wheel construction of shopping carts and the like. 4,592,595, Cl. 301-63.0PW.
Freitag, Friedbert; Hujer, Friedrich; Nagel, Erich; Payrhammer, Bernd; and Zahn, Wolfgang, to Agfa-Gevaert AG. Photographic roller copying apparatus. 4,592,649, Cl. 355-43.000.
Frentzel, Herman E. Low pressure pool cleaner system. 4,592,378, Cl. 134-111.000.
Fresard, Marcel, to Mefina S.A. Sewing head. 4,592,296, Cl. 112-83.000.
Freund Industrial Co., Ltd.: *See*—
Motoyama, Shimesu; Sakashita, Shizuka; Myo, Nagayoshi; Yasumi, Hirotsune; and Ogishima, Hiroaki, 4,592,302, Cl. 118-303.000.
Friday, William A.: *See*—
McRight, Tulon C., Jr.; Friday, William A.; and Mitchell, Ronald W., 4,593,207, Cl. 307-271.000.
Fridge, D. Alan; and Miller, Kenneth A., to Kollmorgen Technologies Corporation. Technique for measuring very small spacings. 4,593,368, Cl. 364-525.000.
Friedberger, Otmar: *See*—
Hahn, Michael; Friedberger, Otmar; and Singer, Gerhard, 4,592,701, Cl. 416-134.00A.
Friedman, Evelyn; and Carswell, William R., to Friedman, Evelyn. Vending machine with coin sorter and totalizer. 4,592,461, Cl. 194-227.000.
Friedman, Howard. Thin flat heat exchanger and method of making same. 4,592,415, Cl. 165-80.500.
Friends of the Disabled Assn., Inc.: *See*—
Strautnieks, Maris; and Snel, Maria A., 4,592,562, Cl. 280-242.0WC.
Froncisz, Wojciech: *See*—
Hyde, James S.; Froncisz, Wojciech; and Lai, Ching-San, 4,593,248, Cl. 324-317.000.
Frye, Kent; and Ewald, Gary T., to Electro-Voice, Incorporated. Loudspeaker system with combination crossover and equalizer. 4,593,405, Cl. 381-99.000.
Fu, Tzerong: *See*—
Ayres, Paul S., Stark, Louis E.; Feldstein, Joel G.; and Fu, Tzerong, 4,592,577, Cl. 285-287.000.
Fuderer, Andrija, to Union Carbide Corporation. Process and apparatus for ammonia synthesis gas production. 4,592,860, Cl. 252-376.000.
Fuji Electric Company Ltd.: *See*—
Kawasaki, Tetsuji; Miyoshi, Noriomi; and Tachibana, Yukimasa, 4,593,190, Cl. 250-223.00R.
Fuji Elmes Co., Ltd.: *See*—
Kawasaki, Tetsuji; Miyoshi, Noriomi; and Tachibana, Yukimasa, 4,593,190, Cl. 250-223.00R.
Fuji Photo Film Co., Ltd.: *See*—
Ichino, Shuichi; Higuchi, Zenichi; and Kuroki, Motoharu, 4,592,885, Cl. 264-171.000.
Ikeda, Kenji; Hayashi, Takayuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,593,298, Cl. 346-200.000.
Miyoshi, Takahito; Okutu, Toshimitu; and Fujiyama, Masaaki, 4,592,952, Cl. 428-323.000.
Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Yamamoto, Takashi, 4,592,633, Cl. 354-76.000.
Seto, Yasuhiro, 4,592,647, Cl. 355-40.000.
Yoshida, Tetsuo; Kokubo, Tadayoshi; Adachi, Keiichi; Ikeda, Tadashi; and Kobayashi, Hidetoshi, 4,592,991, Cl. 430-139.000.
Fuji Xerox Co., Ltd.: *See*—
Ohkubo, Tetsuo; and Kataoka, Hiroyuki, 4,593,324, Cl. 358-261.000.
Fujii, Noriki: *See*—
Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,592,862, Cl. 252-511.000.
Fujii, Tetsuya; Harada, Nobuo; Takeuchi, Shuji; Kato, Yoshiei; Nakamura, Hideo; Sakuraya, Toshikazu; and Habu, Yasuhiro, to Kawasaki Steel Company. Steelmaking of an extremely low carbon steel in a converter. 4,592,778, Cl. 75-59.220.
Fujii, Tooru, to Olympus Optical Co., Ltd. Compact zoom lens system. 4,592,626, Cl. 350-427.000.
Fujimori, Hiroyoshi: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,593,313, Cl. 358-98.000.
Fujimori, Kyoichi; and Ichikawa, Takeo, to Diesel Kiki Co., Ltd. Apparatus for controlling fuel injection advance angle of a fuel injection pump. 4,592,327, Cl. 123-502.000.
Fujimori, Shizuyoshi: *See*—
Irikura, Tsutomu; Takagi, Koichi; Fujimori, Shizuyoshi; and Hirata, Yoshihiro, 4,593,092, Cl. 544-6.000.
Fujimoto, Kazuhisa: *See*—
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, 4,593,097, Cl. 544-347.000.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Hydroxyalkoxy norbornyl ethers. 4,593,143, Cl. 568-665.000.
Fujioka, Takafumi: *See—*
Tominaga, Michiaki; Ogawa, Hidenori; Fujioka, Takafumi; Yang, Yung-hsiung; and Nakagawa, Kazuyuki, 4,593,035, Cl. 514-312.000.
Fujishima, Kazuyasu; Shimotori, Kazuhiro; Ozaki, Hideyuki; and Nakano, Takao, to Mitsubishi Denki Kabushiki Kaisha. MOS dynamic memory device. 4,593,382, Cl. 365-149.000.
Fujitsu Limited: *See—*
Inata, Tsuguo; and Sasa, Shigehiko, 4,593,301, Cl. 357-22.000.
Kuroda, Hideo; Mukawa, Naoki; Matsuda, Kiichi; Honma, Toshihiro; and Fukuda, Hiroshi, 4,593,267, Cl. 340-347.0DD.
Mizushima, Yoshihiro; and Shimizu, Kazuyuki, 4,593,391, Cl. 371-15.000.
Nakajima, Kazuo; and Tanahashi, Toshiyuki, 4,592,791, Cl. 148-171.000.
Ozaki, Takayuki, 4,593,413, Cl. 455-139.000.
Fujiyama, Masaaki: *See—*
Miyoshi, Takahito; Okutu, Toshimitu; and Fujiyama, Masaaki, 4,592,952, Cl. 428-323.000.
Fukatsu, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic transaction machine. 4,593,183, Cl. 235-379.000.
Fukayama, Miyoji; and Onishi, Masayuki, to Toray Silicone Company, Ltd. Organopolysiloxane composition paintable after room temperature curing. 4,593,065, Cl. 524-860.000.
Fukuda, Hiroshi: *See—*
Kuroda, Hideo; Mukawa, Naoki; Matsuda, Kiichi; Honma, Toshihiro; and Fukuda, Hiroshi, 4,593,267, Cl. 340-347.0DD.
Fukuda, Tomiichi. Automatic transportation apparatus making use of underground cable. 4,592,284, Cl. 104-140.000.
Fukushi, Kyosuke: *See—*
Nakayama, Masaharu; Fukushi, Kyosuke; Moriya, Yasuo; and Suzuki, Nobuyoshi, 4,593,067, Cl. 525-92.000.
Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,592,561, Cl. 280-91.000.
Futami, Tooru: *See—*
Takeda, Hitoshi; Kishi, Norimasa; Suzuki, Tadashi; Tomikashi, Minoru; and Futami, Tooru, 4,593,154, Cl. 178-2.00D.
G & D Investments, Ltd.: *See—*
Selfors, Donald L., 4,592,113, Cl. 17-66.000.
G. D. Searle & Co.: *See—*
Liang, Chi-Dean, 4,593,042, Cl. 514-523.000.
G. D. Societa per Azioni: *See—*
Mattei, Riccardo; and Dall'Osso, Gastone, 4,592,470, Cl. 209-535.000.
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, to PPG Industries, Inc. Treated glass fibers and aqueous dispersion and nonwoven mat of the glass fibers. 4,592,956, Cl. 428-391.000.
Gabathuler, Ferdinand; and Nilsson, Erik G., to Swegea Maschinen AG. Band cutting machine. 4,592,260, Cl. 83-74.000.
GAF Corporation: *See—*
Pearman, William O.; Hunt, Joseph L.; and Cunningham, William P., 4,592,770, Cl. 65-128.000.
Gaiger, David J.: *See—*
Magill, Robert J.; and Gaiger, David J., 4,592,535, Cl. 251-298.000.
Gaither, John L., to Caslin, Richard L. Storage cartridge for plastic sheet tubing. 4,592,469, Cl. 206-494.000.
Gajda, Leo P.: *See—*
Gray, Gary L.; and Gajda, Leo P., 4,592,121, Cl. 29-159.100.
Galand, Claude: *See—*
Desblache, Andre ; Galand, Claude; and Vermot-Gauchy, Robert, 4,593,161, Cl. 179-170.200.
Galbraith, Douglas C., to Leland Stanford Junior University, The Board of Trustees of the. Multi-channel implantable neural stimulator. 4,592,359, Cl. 128-419.00R.
Galiasso, Roberto; Salazar, Jose A.; Morales, Alfredo; and Carrasquel, Angel R., to Intevep, S.A. Hydroconversion of heavy crudes with high metal and asphaltene content in the presence of soluble metallic compounds and water. 4,592,827, Cl. 208-59.000.
Gall, Ray A.: *See—*
Nieman, Andrew L.; and Gall, Ray A., 4,592,556, Cl. 277-27.000.
Gallego, Jose M., to Pilkington Brothers P.L.C. Apparatus for the deposition of multi-layer coatings. 4,592,306, Cl. 118-719.000.
Gallimore, Byron A.; and Stone, Charles R. Electro-mechanical stringed bass machine. 4,592,263, Cl. 84-173.000.
Gallist, Helga: *See—*
Wajaroff, Theodor; and Gallist, Helga, 4,592,908, Cl. 424-71.000.
Ganguli, Partha S., to HRI, Inc. Use of ethers in thermal cracking. 4,592,826, Cl. 208-407.000.
Gappa, Gunther: *See—*
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Garber, Robert L. Golf club putter. 4,592,552, Cl. 273-168.000.
Gardner, Hugh C.: *See—*
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Gareis, Ronald E.: *See—*
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Gates Energy Products, Inc.: *See—*
Juergens, Tristan; and Tesch, Hugo, 4,592,972, Cl. 429-160.000.
Gauthier, Francois H.: *See—*
Girault, Herve; Gauthier, Francois H.; and Thomasson, Daniel, 4,592,654, Cl. 356-247.000.
Gegelys, Anthony A., to E. R. Squibb & Sons, Inc. Incontinence pad. 4,592,751, Cl. 604-368.000.
Geis, Timothy R.: *See—*
Koos, William M., Jr.; Geis, Timothy R.; and Rudy, Richard M., Jr., 4,593,278, Cl. 340-748.000.
Geissen, Rolf: *See—*
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Gembus, Hans-Dieter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Closure arrangement for closing a wall opening in a nuclear facility. 4,593,201, Cl. 250-517.100.
Gencarelli, Richard A.; and Wheeler, Edward L., to Uniroyal Chemical Company, Inc. Process for making 2-mercapto benzimidazoles in the presence of a water-insoluble alkanol. 4,593,105, Cl. 548-329.000.
General Dynamics, Pomona Division: *See—*
Shores, Marvin W., 4,592,280, Cl. 102-202.200.
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Borman, Willem F. H.; Craft, Donald I.; and Kramer, Morton, 4,593,077, Cl. 525-444.000.
Bowls, Thurman A., 4,592,610, Cl. 339-65.000.
Campbell, Michael E., 4,592,146, Cl. 33-185.00R.
Dietz, Peter W.; and Peters, Philip H., 4,592,763, Cl. 55-2.000.
Dusa, Donald J.; Kuchar, Andrew P.; and Faust, Guy K., 4,592,201, Cl. 60-262.000.
Fisher, Lynn E., 4,593,163, Cl. 200-80.00R.
Glover, Gary H., 4,593,247, Cl. 324-309.000.
Grajewski, John P., 4,593,371, Cl. 364-571.000.
Kemplin, Steven C., 4,593,308, Cl. 358-10.000.
Kocher, Mark J.; Gareis, Ronald E.; Ketelhut, William J.; and Konrad, Charles E., 4,593,380, Cl. 364-900.000.
Lindsay, Paul H., 4,593,342, Cl. 361-386.000.
Lucas, Gary M., 4,593,085, Cl. 528-18.000.
McMurray, William, 4,593,204, Cl. 307-252.00C.
Reinert, Raymond L.; and Kaufman, Charles D., 4,592,785, Cl. 134-18.000.
Talley, John J., 4,593,058, Cl. 524-122.000.
Vest, Glenn E., 4,592,323, Cl. 123-362.000.
Viertl, John R. M.; and Auger, Mederic E., 4,593,245, Cl. 324-238.000.
Genna, Sebastian: *See—*
Pang, Sing C.; and Genna, Sebastian, 4,593,198, Cl. 250-366.000.
Geo. A. Hormel & Co.: *See—*
Leining, Lyndon R., 4,592,112, Cl. 17-45.000.
Georges, Fournier. Heating coat-hanger for garments. 4,592,497, Cl. 223-69.000.
Georges Moatti: *See—*
Christophe, Theophile; and Moatti, Jean-Claude, 4,592,838, Cl. 210-323.100.
Georgi, Heinz W., to Ivac Corporation. Electronic sphygmomanometer. 4,592,365, Cl. 128-680.000.
German, Jeffry W.: *See—*
Sagedahl, Steven M.; German, Jeffry W.; and Wolfe, Robert M., 4,592,545, Cl. 272-125.000.
Gerritsen, John T., to Jarrow Products, Inc. Magnet support and retainer for interior storm windows. 4,592,180, Cl. 52-203.000.
Gershenson, Edward, to Data General Corporation. Read-write processor with internal diagnostic data path. 4,593,375, Cl. 364-900.000.
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Jacob, Manfred; and Tews, Fritz, 4,592,192, Cl. 53-512.000.
Geurts, Petrus A. M.: *See—*
Roelofs, Johannes C. H.; Eertink, Bastiaan B. B.; and Geurts, Petrus A. M., 4,592,641, Cl. 355-3.0TR.
Ghiringhelli, Guilio: *See—*
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.
Ghiz, George J.: *See—*
Goettl, John M., 4,592,379, Cl. 137-119.000.
Ghizzi, Mario, to Davis Walker Corporation. Water seal for fumeless strand pickling system. 4,592,784, Cl. 134-15.000.
Ghrist, William D., III, to Westinghouse Electric Corp. Floating deadband for speed feedback in turbine load control. 4,593,364, Cl. 364-494.000.
Giacomelli, Renato, to Morwen s.r.l. Eyeglass frames with metallic strip reinforcement traversed by hinge attachment screws. 4,592,629, Cl. 351-41.000.
Gick, Wilhelm: *See—*
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, 4,593,126, Cl. 568-454.000.
Gilbert, David L.: *See—*
Hughes, Brett A.; and Gilbert, David L., 4,592,575, Cl. 285-252.000.
Gilbertson, Peter. Equipment for simulated shooting. 4,592,554, Cl. 273-312.000.
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Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert I., 4,592,798, Cl. 156-578.000.
Gilgen, Hans. Arrangement for damming water and also for draining away the volume of water above a certain level in a vegetation-bearing stratum. 4,592,676, Cl. 405-36.000.
Gilles, Wim: *See—*
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Gillman, Hyman D.: *See*—
Kesling, Haven S., Jr.; and Gillman, Hyman D., 4,592,875, Cl. 252-551.000.
Gilson, Richard W.: *See*—
Burkholder, Richard A.; Gilson, Richard W.; and Walker, Clarence L., 4,592,746, Cl. 604-220.000.
Gioffre, Anthony J.; and Ross, Ronald J., to Union Carbide Corporation. Effervescent compositions. 4,592,855, Cl. 252-89.100.
Giovenco, Robert B.: *See*—
Semp, Bernard A.; and Giovenco, Robert B., 4,592,698, Cl. 414-786.000.
Girault, Herve; Gauthier, Francois H.; and Thomasson, Daniel, to Thomson-CSF. Head-up gunsight using a single optical component for viewing both a reticle and landscape. 4,592,654, Cl. 356-247.000.
Gish Biomedical, Inc.: *See*—
Ebling, Wendell V.; and DeVries, James H., 4,592,749, Cl. 604-283.000.
Gitlitz, Melvin H.; and Leiner, Howard H., to M&T Chemicals Inc. Erodible ship-bottom paints for control of marine fouling. 4,593,055, Cl. 523-122.000.
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Person, Joel I.; and Gjelsvik, Atle, 4,592,184, Cl. 52-334.000.
Glaenzer Spicer: *See*—
Mangiavacchi, Jacques, 4,592,736, Cl. 464-111.000.
Orain, Michel A., 4,592,735, Cl. 464-111.000.
Glasheen, W. Michael, to Baird Corporation. Latch for mounting a goggle system to a face mask. 4,592,096, Cl. 2-427.000.
Globus, Alfred R. Method of making particulate uranium for shaped charge liners. 4,592,790, Cl. 148-126.100.
Glover, Gary H., to General Electric Company. Method of NMR imaging with off-center zoom scan. 4,593,247, Cl. 324-309.000.
Gmohling, Werner: *See*—
Rellermeyer, Heinrich; Meichsner, Walter; and Gmohling, Werner, 4,592,777, Cl. 75-58.000.
Gneiss, Heinz, to Robert Bosch GmbH. Method for bonding electrically conductive wires. 4,593,172, Cl. 219-85.00M.
Goettl, John M., to Ghiz, George J. Fluid distribution valve. 4,592,379, Cl. 137-119.000.
Goetze AG: *See*—
Buran, Ulrich; Fischer, Manfred; and Neuhauser, Hans-Jochem, 4,592,964, Cl. 428-610.000.
Gogo Kimura: *See*—
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Goldwasser, Judah M.; Adolph, Horst G.; and Ebner, Cynthia L., to United States of America, Navy. Preparation of 1,3-dioxa-5,5,6,6,7,7-hexafluorocyclooctane. 4,593,110, Cl. 549-347.000.
Goller, Ernst; and Kazmaier, Gunther, to H. Stoll GmbH & Co. Fabric draw-off roller on flat-bed knitting machines. 4,592,214, Cl. 66-149.00R.
Golob, Theodore B.; Gilles, Wim; Jasinski, Stan K.; and Whitehead, Patrick B. G., to Canadian Patents and Development Limited. Continuous tree harvestor. 4,592,398, Cl. 144-3.00D.
Goodyear Tire & Rubber Company, The: *See*—
Castner, Kenneth F., 4,592,850, Cl. 252-8.55D.
Gorner, Bernd; and Zeyher, Heinz, to Beloit Corporation. Method for controlling the position of the cutting edges of longitudinal web cutting blades and a longitudinal cutting apparatus utilizing the same. 4,592,259, Cl. 83-13.000.
Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.
Gors, Heinrich C.: *See*—
Jansons, Viktors; and Gors, Heinrich C., 4,593,086, Cl. 528-173.000.
Goshgarian, Robert A. Orthodontic palatal arch bar and method of using same. 4,592,725, Cl. 433-7.000.
Goto, Toshihiro: *See*—
Yamada, Ryuichi; Hirokawa, Toshio; and Goto, Toshihiro, 4,592,389, Cl. 137-625.220.
Goto, Yasuyuki: *See*—
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Gould Inc.: *See*—
Busta, Heinz H., 4,592,238, Cl. 73-727.000.
Young, Peter L.; Oprysko, Modest M.; and Beranek, Mark W., 4,592,975, Cl. 430-5.000.
Gourley, Robert N., to Eastman Kodak Company. Disperse and acid azo dyes having one or two cinnamoyl substituents on a thiazole, isothiazole or thiadiazole diazonium moiety and having an aniline, tetrahydroquinoline or benzomorpholine coupler. 4,593,087, Cl. 534-784.000.
Gourley, Robert N., to Eastman Kodak Company. 2-amino-cinnamoylthiophene azo dyes having aniline, tetrahydroquinoline, or benzomorpholine couplers. 4,593,088, Cl. 534-768.000.
Goyette, Lewis E.; and Tobey, James F., Jr. Process and compositions for stabilization of forages. 4,592,915, Cl. 426-321.000.
Grabowski, Robert: *See*—
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,592,710, Cl. 425-141.000.
Graesser Laboratories, Ltd.: *See*—
Baker, James A., 4,592,906, Cl. 424-60.000.
Graham, John A. Clamping apparatus for a power jointer. 4,592,400, Cl. 144-253.00E.
Graham, Randolph H.; and Harrison, Joel N., to Quantum Corporation. Optical encoder with digital gain compensation controlling source intensity. 4,593,194, Cl. 250-231.0SE.
Grajewski, John P., to General Electric Company. X-ray tube emission current controller. 4,593,371, Cl. 364-571.000.
Gram, Klaus, to Brodrene Gram A/S. Apparatus for insertion sticks into freezing pockets. 4,592,709, Cl. 425-126.00S.
Grant, Darwin D.: *See*—
Anderson, C. Keith; Vieth, George C., Jr.; Vance, Lane D.; and Grant, Darwin D., 4,592,485, Cl. 221-150.0HC.
Grant, David: *See*—
Austen, Brian M.; Cliffe, Steven; Grant, David; and Hermon-Taylor, John, 4,593,018, Cl. 514-16.000.
Grant, Frederic F., to Datatape, Inc. Coaxial reel assembly apparatus. 4,592,522, Cl. 242-193.000.
Gravestock, Thomas B.: *See*—
Benjamin, Loftus A.; Aikens, Donald T.; Gravestock, Thomas B.; and Soehodho, Herman, 4,592,771, Cl. 71-34.000.
Gray, Gary L.; and Gajda, Leo P., to Kelsey-Hayes Company. Tire and wheel assembly. 4,592,121, Cl. 29-159.100.
Greb, Wolfgang: *See*—
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, 4,593,126, Cl. 568-454.000.
Green, James B. P., Jr.: *See*—
Sherman, Earle C.; and Green, James B. P., Jr., 4,592,190, Cl. 53-491.000.
Gregory, Reginald. to British Petroleum Company P.L.C., The. Method for promoting the activity and/or extending the life of cation-exchangeable layered clay catalysts in proton-catalyzed reactions. 4,593,135, Cl. 585-446.000.
Gregory, Walter J., to Rohm and Haas Company. Flushable reference cell for potentiometric measurements. 4,592,823, Cl. 204-409.000.
Grieder, Max; Evans, Albert D.; and Weibel, Hans, to Rosenmund AG. Pressure filter. 4,592,835, Cl. 210-107.000.
Griffith, Robert W.; and Singer, Jack, to Sandoz, Inc. Method of treating depression. 4,593,031, Cl. 514-288.000.
Grigel, Wolfgang; Kellerwessel, Hans; and Zisselmar, Raimund, to Klockner-Humboldt-Deutz AG. Method and apparatus for the common grinding of two or more brittle materials having different grinding properties. 4,592,512, Cl. 241-24.000.
Grimes, Frank H.; and Sinha, Ram R. P., to Westinghouse Electric Corp. Method of constructing an electrical transformer. 4,592,133, Cl. 29-605.000.
Grolig, Johann: *See*—
Stammann, Gunter; Grolig, Johann; Becker, Robert; and Waldmann, Helmut, 4,593,116, Cl. 560-24.000.
Grothe, Horst, to SMS Schloemann-Siemag Aktiengesellschaft. Apparatus for spraying a propellant-coolant mixture upon a continuously cast strand. 4,592,510, Cl. 239-432.000.
Grotts, Jeffrey W.; and Abreu, Rene, to Perkin-Elmer Corporation, The. Non-imaging illumination incidence angle detection system. 4,593,187, Cl. 250-203.00R.
Groupe Finot: *See*—
Finot, Jean-Marie, 4,592,298, Cl. 114-39.000.
Grow, Robert M., to Burroughs Corporation. Write token regeneration in a timed token ring. 4,593,280, Cl. 340-825.050.
Grubbs, Harvey J.: *See*—
Houminer, Yoram; and Grubbs, Harvey J., 4,592,373, Cl. 131-276.000.
Gruber, Murray. Method of reducing skin irritation from benzoyl peroxide. 4,593,046, Cl. 514-717.000.
GTE Laboratories Incorporated: *See*—
Proud, Joseph M.; Baird, Donald H.; Kramer, Jerry M.; and Lester, Joseph E., 4,593,397, Cl. 372-82.000.
GTE Products Corporation: *See*—
Cheney, Richard F.; and Pierce, Richard H., 4,592,781, Cl. 75-249.000.
Guay, Phillippe: *See*—
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.
Guero, Jean P.; and Lacan, Guy H., to La Telemecanique Electrique. Contact with a magnetic compensator. 4,593,260, Cl. 335-195.000.
Guglielmi, Mauro; Pighetti, Antonio; Vezzani, Savino; and Acerbi, Sergio, to Edi System s.r.l. Solenoid-operated two-way directional needle-valve, normally closed. 4,592,533, Cl. 251-30.010.
Guignard, Paul C.: *See*—
Ream, Michael D.; and Guignard, Paul C., 4,592,447, Cl. 182-127.000.
Guilbault, Lawrence J.; and McEntee, Thomas C., to Morton Thiokol, Inc. Method for removal of organometallics from wastewater. 4,592,843, Cl. 210-692.000.
Guinot, Philippe M., to Societe de Conseils de Recherches et d'Applications Scientifiques. Therapeutic methods for the treatment of hangover. 4,593,020, Cl. 514-159.000.
Gupta, Manoj K.; and Salee, Gideon, to Occidental Chemical Corporation. Smoke retardant polyvinyl halide compositions. 4,593,060, Cl. 524-397.000.
Gupte, Pradeep M.; and Sundaram, Ravi K. Surgical prosthetic vessel graft and catheter combination and method. 4,592,754, Cl. 623-1.000.
Gurumurthy, Kadagattor V., to RCA Corporation. Teletext magazine code detector. 4,593,374, Cl. 364-900.000.
Gussbacher, Udo: *See*—
Spielmann, Norbert; Gussbacher, Udo; Walter, Wolfgang; Bauer, Hermann; and Porzel, Rainer, 4,592,438, Cl. 180-89.100.
Gustavsson, Olov E. Apparatus for packaging resiliently compressible articles. 4,592,193, Cl. 53-530.000.
Gutierrez, Pedro. Localizing device. 4,592,356, Cl. 128-339.000.

Gutjahr, Lothar, to Klockner-Werke Aktiengesellschaft. Plastification and injection device for an injection molding machine. 4,592,712, Cl. 425-145.000.

Gutjahr, Lothar, to Klockner-Werke Aktiengesellschaft. Mold closing unit of an injection molding machine. 4,592,713, Cl. 425-150.000.

Gutjahr, Lothar, to Klockner-Werke Aktiengesellschaft. Mold closing unit of an injection molding machine. 4,592,714, Cl. 425-150.000.

Guyenet, Patrice G.: *See—*
Jagger, Janine C.; Pearson, Richard D.; Guyenet, Patrice G.; and Brand, Jessica J., 4,592,744, Cl. 604-192.000.

H. Stoll GmbH & Co.: *See—*
Goller, Ernst; and Kazmaier, Gunther, 4,592,214, Cl. 66-149.00R.

Haak, Peter A.: *See—*
Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, Keith, 4,592,896, Cl. 422-109.000.

Habu, Yasuhiro: *See—*
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Hagemeister, Robert C., to Webster Spring Co. Inc. Anchor for securing the lower end of a spring. 4,592,106, Cl. 5-245.000.

Hager, Robert J.; and Wood, R. Andrew, to Honeywell Inc. Apparatus for liquid phase epitaxy of mercury cadmium telluride. 4,592,304, Cl. 118-415.000.

Haglund, Ingemar: *See—*
Hellner, Lars; Haglund, Ingemar; Ronn, Torsten; and Albrektsson, Kjell, 4,592,283, Cl. 102-493.000.

Hahn, Michael; Friedberger, Otmar; and Singer, Gerhard, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Rotor blade, especially for a rotary wing aircraft. 4,592,701, Cl. 416-134.00A.

Haissig, Manfred, to Haissig, Manfred. Device for horizontal continuous casting of metals and alloys. 4,592,408, Cl. 164-413.000.

Hajdu, Istvan: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Halczenko, Wasyl: *See—*
Hartman, George D.; Halczenko, Wasyl; and Young, Steven D., 4,593,033, Cl. 514-290.000.

Haley, John E., Jr.; Lynch, Michael J.; and Mouser, Charles L., to Halliburton Company. Apparatus and method for monitoring a plurality of flow meters. 4,593,365, Cl. 364-510.000.

Hall, Raymond J.; and Burton, Ian S., to Compair Power Tools Limited. Fluid-pressure operated tools. 4,592,430, Cl. 173-12.000.

Hallback, Arvo J. Rodent trap with guard means. 4,592,162, Cl. 43-81.000.

Halliburton Company: *See—*
Haley, John E., Jr.; Lynch, Michael J.; and Mouser, Charles L., 4,593,365, Cl. 364-510.000.

Hallikas, Erkki T.; and Lindstrom, Lennart, to Oy Nokia AB. Device for guiding a cable onto a reel. 4,592,521, Cl. 242-158.00R.

Halluin, Albert P.; and Barnett, Allan E., to Exxon Research and Engineering Co. Catalyst support compositions. 4,593,014, Cl. 502-242.000.

Halm, Horst, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Manipulating device for performing remotely-controlled work with a tool. 4,592,258, Cl. 81-57.400.

Halomet, Inc.: *See—*
Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., 4,592,988, Cl. 430-107.000.

Hamaguchi, Toshiaki: *See—*
Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,592,862, Cl. 252-511.000.

Hamamoto, Takashi: *See—*
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, 4,592,980, Cl. 430-57.000.

Hamashima, Yoshio: *See—*
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.

Hamilton, Gary L.: *See—*
Rhoe, Andrei; Pisani, Joseph A.; Hamilton, Gary L.; and Suciu, George D., 4,592,831, Cl. 208-309.000.

Hamm, Eddie J., to Otis Engineering Corporation. Gas lift valve. 4,592,380, Cl. 137-155.000.

Hammen, Gunther: *See—*
Knofel, Hartmut; Penninger, Stefan; Hammen, Gunther; and Heitkamper, Peter, 4,593,117, Cl. 560-025.000.

Hanada, Toshiro: *See—*
Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,592,996, Cl. 435-11.000.

Hanazono, Masanobu: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.

Hanisch, Michael: *See—*
Bauer, Karl; and Hanisch, Michael, 4,592,119, Cl. 28-271.000.

Hannon, Charles N.; and Vallender, Leonard J., to Hannon, Charles N. Plastic closure with mechanical pilfer-proof. .4,592,475, Cl. 215-252.000.

Hansen, John B.: *See—*
Lassen, Jorgen B.; Christensen, Jorgen A.; Petersen, Erling N.; and Hansen, John B., 4,593,036, Cl. 514-317.000.

Hansson, Ingvar: *See—*
Niemi, Ingemar; and Hansson, Ingvar, 4,592,282, Cl. 102-313.000.

Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, to Computer Basic Technology Research Association. Method of patterning thin film. 4,592,801, Cl. 156-643.000.

Hara, Tatsuro, to Sun Food Co., Ltd. Method of producing an artificial truffle. 4,592,913, Cl. 426-104.000.

Hara, Toyoyuki: *See—*
Hirota, Hisatoshi; and Hara, Toyoyuki, 4,593,166, Cl. 200-83.00J.

Harada, Nobuo: *See—*
Fujii, Tetsuya; Harada, Nobuo; Takeuchi, Shuji; Kato, Yoshiei; Nakamura, Hideo; Sakuraya, Toshikazu; and Habu, Yasuhiro, 4,592,778, Cl. 75-59.220.

Hardman, Harley F.; and Beach, Ronald I., to Standard Oil Company, The. Catalyst for the preparation of alcohols from synthesis gas. 4,593,015, Cl. 502-303.000.

Harris, David; and Hays, Alan, to Black & Decker Inc. Electric motor brush box with stressed opposing walls. 4,593,221, Cl. 310-242.000.

Harris, Robert F.: *See—*
Schmidt, Donald L.; and Harris, Robert F., 4,592,930, Cl. 427-133.000.

Harris, William G.; and Mason, Stuart J. Signal processors for digital telephone exchanges. 4,593,388, Cl. 370-67.000.

Harrison, Joel N.: *See—*
Graham, Randolph H.; and Harrison, Joel N., 4,593,194, Cl. 250-231.0SE.

Harrison, Shelley: *See—*
Swartz, Jerome; Barkan, Edward; and Harrison, Shelley, 4,593,186, Cl. 235-472.000.

Hart, James A.; and Jacks, R. Keith, to SCM Corporation. Tamper evidencing container caps. 4,592,480, Cl. 220-270.000.

Hartman, George D.; Halczenko, Wasyl; and Young, Steven D., to Merck & Co., Inc. Substituted indeno[2,1-c] pyridines useful as calcium channel blockers. 4,593,033, Cl. 514-290.000.

Hartman, James; and Schwartzman, Blake. Watch protector. 4,592,660, Cl. 368-286.000.

Hartsock, Dale L., to Ford Motor Company. Method of making and apparatus for composite pistons. 4,592,268, Cl. 92-212.000.

Haruta, Masahiro: *See—*
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, 4,592,980, Cl. 430-57.000.

Harvey, Andrew C., to Foster-Miller, Inc. Piston ring seal with pressure distribution grooves. 4,592,559, Cl. 277-214.000.

Hasebe, Khoki: *See—*
Bandai, Yoshiaki; and Hasebe, Khoki, 4,593,372, Cl. 364-719.000.

Hashimoto, Akira; Saito, Susumu; Arimoto, Akira; and Morita, Kenji, to Hitachi Koki Co., Ltd.; and Hitachi Ltd. Light-beam scanning apparatus. 4,592,622, Cl. 350-395.000.

Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Electronic translator for specifying a sentence with at least one key word. 4,593,356, Cl. 364-419.000.

Hashimoto, Shunichi: *See—*
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,593,094, Cl. 544-224.000.

Hashizume, Hiroshi; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries Limited. Process for preparing terephthalic acid by the catalytic oxidation with air of p-xylene in a water containing acetic acid solvent. 4,593,122, Cl. 562-414.000.

Haskell, Barin G.: *See—*
Eng, Kai Y.; Haskell, Barin G.; and Schmidt, Robert L., 4,593,318, Cl. 358-142.000.

Haskell, Donald M.: *See—*
Howell, Jerald A.; Tabler, Donald C.; and Haskell, Donald M., 4,592,830, Cl. 208-94.000.

Hata, Akio: *See—*
Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,592,862, Cl. 252-511.000.

Hatanai, Takashi: *See—*
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,592,963, Cl. 428-544.000.

Hatfield, John G., to AMP Incorporated. Apparatus for preparing the end of a shielded flat cable. 4,592,253, Cl. 81-9.510.

Hattori, Takashi: *See—*
Kobayashi, Nobuyuk; Hattori, Takashi; and Ito, Toshimitsu, 4,592,315, Cl. 123-188.00M.

Hawkins, George C., to Motorola, Inc. Portable telephone ID code transfer system. 4,593,155, Cl. 179-2.0EA.

Hayafuji, Yoshinori, to Sony Corporation. Method of recrystallizing a polycrystalline, amorphous or small grain material. 4,592,799, Cl. 156-617.00R.

Hayakawa, Yuji, to Teac Corporation. Magnetic data storage apparatus having a magnetic disk normally in contact with a transducer head, and method of operation. 4,593,329, Cl. 360-75.000.

Hayano, Seiki; Yokogawa, Kanae; and Kurooka, Shigeru, to Dainippon Pharmaceutical Co., Ltd. Reagent for streptococcal anti-esterase assay. 4,592,995, Cl. 435-7.000.

Hayashi, Takayuki: *See—*
Ikeda, Kenji; Hayashi, Takayuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,593,298, Cl. 346-200.000.

Hayashida, Tadahiro: *See—*
Suizu, Dairi; Kishimoto, Taketoshi; and Hayashida, Tadahiro, 4,592,692, Cl. 414-70.000.

Hayes, Michael E.: *See—*
Williams, Joseph L.; Sansing, John W.; Hayes, Michael E.; and Deal, James F., 4,592,786, Cl. 134-22.180.

Hays, Alan: *See—*
Harris, David; and Hays, Alan, 4,593,221, Cl. 310-242.000.

Hays, Robert C., to United States of America, Interior. Soil pulverizing mill. 4,592,515, Cl. 241-69.000.

Hazelton, Donald R.: *See—*
Puydak, Robert C.; and Hazelton, Donald R., 4,593,062, Cl. 524-426.000.

Heck, Gunter: *See—*
Ilgner, Hartmut; Thiagarajan, Natarajan; Heck, Gunter; and Lienerth, Aladar, 4,592,806, Cl. 203-71.000.

Heckman, Harold, to Lightweight Processing Co. Process and apparatus for forming lightweight inorganic aggregate. 4,592,722, Cl. 432-13.000.

Hedden, Jerry C.: *See—*
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,592,956, Cl. 428-391.000.

Hein-Werner Corporation: *See—*
Eck, Leonard F., 4,592,225, Cl. 72-457.000.

Heinzelmann, Karl-Georg: *See—*
Forster, Helmut; Heinzelmann, Karl-Georg; Siebold, Horst; and Vetter, Jurgen, 4,593,261, Cl. 335-300.000.

Heitkamper, Peter: *See—*
Knofel, Hartmut; Penninger, Stefan; Hammen, Gunther; and Heitkamper, Peter, 4,593,117, Cl. 560-025.000.

Hellner, Lars; Haglund, Ingemar; Ronn, Torsten; and Albrektsson, Kjell, to Aktiebolaget Bofors. Explosive shell case. 4,592,283, Cl. 102-493.000.

Hellon, Keith: *See—*
Hlinsky, Emil J.; and Hellon, Keith, 4,592,601, Cl. 312-111.000.

Hellwig, Klaus D. Inflatable-inflated cushion for seat. 4,592,589, Cl. 297-284.000.

Henmi, Kojiro; and Miyasaka, Eiji, to Dainippon Screen Manufacturing Co., Ltd. Sheet material contacting device. 4,592,652, Cl. 355-76.000.

Henning, Dominique S.: *See—*
St-Pierre, Leon E.; Brown, G. Ronald; Henning, Dominique S.; and Bouvier, Marlene, 4,593,073, Cl. 525-328.400.

Henry, George H., to Aluminum Company of America. Full pot anode change in the production of aluminum. 4,592,813, Cl. 204-67.000.

Hepko, Samuel. High efficiency performance kinetic occlude system with rotary valve. 4,592,312, Cl. 123-80.0BB.

Herbert Richter, Metallwaren-Apparatebau GmbH & Co.: *See—*
Richter, Herbert, 4,592,219, Cl. 70-456.00R.

Herczog, Andrew, to Corning Glass Works. Tubular capacitor end terminations. 4,593,341, Cl. 361-310.000.

Herman, Robert D. Electrically actuated angular orientation indicating device. 4,592,147, Cl. 33-366.000.

Herman, Thomas: *See—*
Lidow, Alexander; and Herman, Thomas, 4,593,302, Cl. 357-23.400.

Hermann Wangner - GmbH & Co. KG: *See—*
Borel, Georg, 4,592,395, Cl. 139-383.00A.
Borel, Georg; and Jonsson, Bengt, 4,592,396, Cl. 139-425.00A.

Hermon-Taylor, John: *See—*
Austen, Brian M.; Cliffe, Steven; Grant, David; and Hermon-Taylor, John, 4,593,018, Cl. 514-16.000.

Herndon, Gerald F., to Boeing Company, The. Ejection seat restraint system for limbs and head. 4,592,523, Cl. 244-122.0AG.

Hesselgren, Tore G. Method for examining circuit boards. 4,592,138, Cl. 29-846.000.

Heydlauff, Bruce M., to United States of America, Navy. Moving scene display for passive radiation-wave imaging system. 4,593,317, Cl. 358-140.000.

Hickson, Jerome B., Jr.: *See—*
Bergeron, Paul H.; Carpenter, Kurt D.; Hickson, Jerome B., Jr.; Jackson, Roger K.; Lallier, Keith W.; and Malone, Elba K., 4,593,362, Cl. 364-488.000.

Hieber, Konrad; and Mayer, Norbert, to Siemens Aktiengesellschaft. Method for monitoring and regulating the composition and the layer thickness of metallically conductive alloy layers during their manufacture. 4,592,921, Cl. 427-9.000.

Higa, Richard M., to Sanders Associates, Inc. X, Y plotter. 4,593,293, Cl. 346-136.000.

Higashiguchi, Teruaki; Miyakawa, Nobuhiro; Yano, Koji; Yamamoto, Kazuo; and Kawakami, Yoshinobu, to Mita Industrial Co., Ltd. Copying machine having reduced image memory. 4,592,643, Cl. 355-3.00R.

Higashio, Yasuhiko: *See—*
Usui, Masahiro; and Higashio, Yasuhiko, 4,593,012, Cl. 502-167.000.

High Resolution Television, Inc: *See—*
Songer, Jimmie D., 4,593,310, Cl. 358-37.000.

Higuchi, Ryoichi; Honma, Masao; Sakurai, Takao; and Mikami, Naoko, to Ajinomoto Company, Inc. Smectic liquid crystal compound and liquid crystal compositions. 4,592,858, Cl. 252-299.660.

Higuchi, Zenichi: *See—*
Ichino, Shuichi; Higuchi, Zenichi; and Kuroki, Motoharu, 4,592,885, Cl. 264-171.000.

Hildebrand, David B.; and Karoly, David E., to Honeywell, Inc. Pipeline multiplexer. 4,593,390, Cl. 370-112.000.

Hileman, John. Gutter protector. 4,592,174, Cl. 52-12.000.

Hill, Howard D., to Varian Associates, Inc. NMR tuning procedure. 4,593,246, Cl. 324-307.000.

Hill-Rom Company, Inc.: *See—*
Foster, L. Dale; and Peck, William H., 4,592,104, Cl. 5-66.000.

Hillman, Alfred K., Jr.: *See—*
Bristol, L. Rodney; Hillman, Alfred K., Jr.; and Law, William Q., 4,593,242, Cl. 324-121.00R.

Hillman, Gary: *See—*
Rubin, Richard H.; and Hillman, Gary, 4,592,926, Cl. 427-82.000.

Hillstrom, David U.: *See—*
Seely, James R.; and Hillstrom, David U., 4,592,530, Cl. 248-475.100.

Hilpert, Edwin J.: *See—*
Baugh, Charles R.; Hilpert, Edwin J.; Kushin, George R.; Park, Yoon B.; and Dambrackas, William A., 4,593,399, Cl. 375-104.000.

Hilti Aktiengesellschaft: *See—*
Durr, Paul, 4,592,257, Cl. 81-429.000.
Neumaier, Anton; and Theissig, Werner, 4,592,560, Cl. 279-81.000.

Hindley, Richard M., to Beecham Group p.l.c. 6-oxomorpholines. 4,593,023, Cl. 514-233.000.

Hinney, Harry R.; and Murphy, John R., to Atlantic Richfield Company. Stabilized polyhydroxybutadiene compounds. 4,593,128, Cl. 568-701.000.

Hintner, Josef, to Knorr-Bremse GmbH. Pulsating brake accelerator for rail vehicle air brake. 4,592,598, Cl. 303-37.000.

Hipp, James, to Petro-Drive, Inc. Casing hanger apparatus and method of installation therefor. 4,592,422, Cl. 166-96.000.

Hirahara, Takuho: *See—*
Ueda, Sei; Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Asami, Kazutomo; and Wada, Fumio, 4,592,705, Cl. 418-63.000.

Hirai, Yutaka: *See—*
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, 4,592,980, Cl. 430-57.000.

Hirata, Yoshihiro: *See—*
Irikura, Tsutomu; Takagi, Koichi; Fujimori, Shizuyoshi; and Hirata, Yoshihiro, 4,593,092, Cl. 544-6.000.

Hirata, Yutaka: *See—*
Takamoto, Tsutomu; Ohhashi, Yasutake; Nishimura, Hisao; Hirata, Yutaka; Okazaki, Takashi; and Yoshihara, Masahiro, 4,592,410, Cl. 164-453.000.

Hirayama Setsubi Kabushiki Kaisha: *See—*
Hirayama, Shoji, 4,592,210, Cl. 62-288.000.

Hirayama, Shoji, to Hirayama Setsubi Kabushiki Kaisha. Air conditioner. 4,592,210, Cl. 62-288.000.

Hirayama, Sigeru: *See—*
Naganuma, Tsutomu; Hirayama, Sigeru; Kumagai, Hiroji; Sawada, Manabu; Tanaka, Tsuneo; and Kumano, Isao, 4,592,977, Cl. 430-18.000.

Hirokawa, Toshio: *See—*
Yamada, Ryuichi; Hirokawa, Toshio; and Goto, Toshihiro, 4,592,389, Cl. 137-625.220.

Hirose Electric Co., Ltd.: *See—*
Kikuta, Sigeru, 4,592,612, Cl. 339-143.00R.

Hirose, Toshifumi; and Isayama, Katsuhiko, to Kanegafushi Kagaku Kogyo Kabushiki Kaisha. Curing composition containing polyether having reactive silicon-containing group and a (meth)acrylate polymer. 4,593,068, Cl. 525-100.000.

Hirota, Akira; and Nagaoka, Yoshimichi, to Victor Company of Japan, Ltd. Color video signal recording and/or reproducing system. 4,593,327, Cl. 358-330.000.

Hirota, Hisatoshi; and Hara, Toyoyuki, to TGK Company, Limited. Dual action pressure switch. 4,593,166, Cl. 200-83.00J.

Hirsch, Richard F., to USM Corporation. Fastener presentation device. 4,592,136, Cl. 29-809.000.

Hishida, Hiroshi: *See—*
Kanda, Hajime; Murase, Katsuo; Hishida, Hiroshi; Adachi, Eiichi; Wada, Yoshinori; and Koseki, Yuji, 4,593,323, Cl. 358-256.000.

Hitachi Koki Co., Ltd.: *See—*
Hashimoto, Akira; Saito, Susumu; Arimoto, Akira; and Morita, Kenji, 4,592,622, Cl. 350-395.000.

Hitachi, Ltd.: *See—*
Amada, Haruo, 4,593,168, Cl. 219-10.55M.
Arita, Setsuo; and Sato, Takao, 4,593,249, Cl. 328-137.000.
Hashimoto, Akira; Saito, Susumu; Arimoto, Akira; and Morita, Kenji, 4,592,622, Cl. 350-395.000.
Ishida, Keizo; Ohshima, Yoshikuni; Mukaidani, Toyoyuki; Okouchi, Isao; and Izumi, Kenkichi, 4,592,419, Cl. 165-112.000.
Karino, Kimiji; and Tanabe, Yoshiyuki, 4,592,326, Cl. 123-494.000.
Ogura, Satoshi; Sugiyama, Sakae; and Koga, Kazunori, 4,592,237, Cl. 73-602.000.
Sugimoto, Koichi; and Sekine, Tsugio, 4,593,366, Cl. 364-513.000.
Toyama, Eiji; and Sugano, Akira, 4,592,293, Cl. 110-347.000.
Uchino, Megumi, 4,593,283, Cl. 340-825.070.

Hitachi Metals, Ltd.: *See—*
Inoue, Akira; and Otsuka, Tadao, 4,592,566, Cl. 280-433.000.
Kanai, Kenichi; Shimoe, Osamu; and Tashiro, Sadaji, 4,592,645, Cl. 355-14.00D.

Hitomi, Mitsuo; Sasaki, Junzo; and Ueda, Kazuhiko, to Mazda Motor Corporation. Intake device for internal combustion engine. 4,592,310, Cl. 123-52.00M.

Hitotsuya, Ryoichi: *See—*
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Yamamoto, Munemitsu; and Hitotsuya, Ryoichi, 4,592,892, Cl. 422-28.000.

Hizukuri, Susumu, to Daikin Industries, Ltd. Strains of Aspergillus and use thereof to produce amylolytic enzymes. 4,593,005, Cl. 435-203.000.

Hjertman, Birger T.; and Bennwik, Percy E., to KabiVitrum AB. Apparatus for mixing liquids. 4,592,743, Cl. 604-82.000.
Hlinsky, Emil J.; and Hellon, Keith, to MacLean-Fogg Company. Expandable modular storage system. 4,592,601, Cl. 312-111.000.
Hluchjy, Michael G.: *See—*
Acampora, Anthony; Hluchjy, Michael G.; and Tsao, Chan D., 4,593,282, Cl. 340-825.500.
Hock, Robert H.: *See—*
Clifford, Mark J.; Hock, Robert H.; Jagunich, Douglas M.; and Robinson, Paul J., 4,593,284, Cl. 340-870.180.
Hoechst Aktiengesellschaft: *See—*
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,592,803, Cl. 159-4.020.
von der Eltz, Hans-Ulrich, 4,592,107, Cl. 8-149.100.
Winklemann, Erhardt; Durckheimer, Walter; and Raether, Wolfgang, 4,593,027, Cl. 514-253.000.
Hoericke, Bernhard: *See—*
Tamm, Franz; Hoericke, Bernhard; and Joachim, Arnold, 4,592,788, Cl. 148-12.00B.
Hoffmann, Jurgen; and Preis, Lothar, to Bayer Aktiengesellschaft. Sucker rods. 4,592,421, Cl. 166-66.000.
Hoffmann-La Roche Inc.: *See—*
Reiner, Roland; and Weiss, Urs, 4,593,093, Cl. 544-22.000.
Hofmann, Detlev. Infinitely variable transmission. 4,592,246, Cl. 74-190.000.
Hojo, Yoshikata: *See—*
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.
Hok, Bertil: *See—*
Bijlenga, Bo; Hok, Bertil; and Nilsson, Maria, 4,592,664, Cl. 374-131.000.
Holm, David R.; and Wubben, Carl A., to Deere & Company. Radiator sand screen mounting arrangement. 4,592,437, Cl. 180-68.600.
Holmblad, Carolann M.: *See—*
Jevne, Allan H.; Vegoe, Brett R.; Holmblad, Carolann M.; and Cahalan, Patrick T., 4,593,053, Cl. 523-111.000.
Holmstrom, Sten, to Mo och Domsjo AB. Apparatus and process for separating cellulose fluff fibers from waste fibrous material. 4,592,115, Cl. 19-82.000.
Holter, Samuel N.: *See—*
Dressler, Hans; Holter, Samuel N.; and Znidarsic, Nancy, 4,592,783, Cl. 106-14.050.
Homecrest Industries Incorporated: *See—*
Bottemiller, Donald L., 4,592,126, Cl. 29-446.000.
Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, to Knorr-Bremse GmbH. Hydraulic brake for vehicles. 4,592,597, Cl. 303-15.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Furukawa, Yoshimi; and Sano, Shoichi, 4,592,561, Cl. 280-91.000.
Matsuki, Ikuo; Itai, Yasushi; and Nakamura, Kenji, 4,592,458, Cl. 192-83.000.
Shiratsuchi, Kouji; and Nakano, Hiroshi, 4,592,316, Cl. 123-195.00C.
Honeycomb Panels Patent Association, Inc.: *See—*
See, Jacques L., 4,592,183, Cl. 52-309.400.
Honeywell Inc.: *See—*
Abel, Irving R., 4,593,322, Cl. 358-227.000.
Egli, Werner H., 4,592,656, Cl. 356-350.000.
Hager, Robert J.; and Wood, R. Andrew, 4,592,304, Cl. 118-415.000.
Hildebrand, David B.; and Karoly, David E., 4,593,390, Cl. 370-112.000.
Honeywell Information Systems Inc.: *See—*
Chase, Mark T.; and Middleton, Michael C., 4,593,349, Cl. 364-200.000.
Hong, Se J.; Nair, Ravindra K.; and Shapiro, Eugene, to International Business Machines Corporation. High speed machine for the physical design of very large scale integrated circuits. 4,593,351, Cl. 364-200.000.
Hong, Se J.: *See—*
Burstein, Michael; Hong, Se J.; and Pelavin, Richard N., 4,593,363, Cl. 364-491.000.
Honma, Masao: *See—*
Higuchi, Ryoichi; Honma, Masao; Sakurai, Takao; and Mikami, Naoko, 4,592,858, Cl. 252-299.660.
Honma, Toshihiro: *See—*
Kuroda, Hideo; Mukawa, Naoki; Matsuda, Kiichi; Honma, Toshihiro; and Fukuda, Hiroshi, 4,593,267, Cl. 340-347.0DD.
Hopkins, John F., to Hydril Company. Spring ring and hat ring seal. 4,592,558, Cl. 277-205.000.
Horiba, Ltd.: *See—*
Miyatake, Kimio; and Aoki, Junji, 4,593,197, Cl. 250-343.000.
Horiuchi, Kuniyasu, to Sumitomo Rubber Industries, Inc. Tennis balls and core therefor. 4,592,550, Cl. 273-61.00C.
Horiuchi, Shigenori: *See—*
Amano, Satoru; Horiuchi, Shigenori; and Shinohara, Takeru, 4,592,621, Cl. 350-358.000.
Horn, Werner: *See—*
Patzelt, Ingeborg; and Horn, Werner, 4,593,185, Cl. 235-382.000.
Horwath, Robert O., to Nabisco Brands, Inc. High temperature isomerization process. 4,593,001, Cl. 435-94.000.
Hosch, Ludwig, to Rohm GmbH. Method for polymerizing methyl methacrylate. 4,593,064, Cl. 524-718.000.
Hoshino, Kazuo: *See—*
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,592,965, Cl. 428-621.000.
Hotset Heizpatronen und Zubehor GmbH: *See—*
Schwarzkopf, Eugen, 4,593,182, Cl. 219-544.000.
Houminer, Yoram; and Grubbs, Harvey J., to Philip Morris Inc. Smoking compositions. 4,592,373, Cl. 131-276.000.
Hovel, Harold J.; and McKoy, Thermon E., to International Business Machines Corporation. Process for diffusing impurities into a semiconductor body vapor phase diffusion of III–V semiconductor substrates. 4,592,793, Cl. 148-189.000.
Howard, Frederick W.; and Strong, Keith T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Enveloping gripper. 4,592,581, Cl. 294-2.000.
Howell, Jerald A.; Tabler, Donald C.; and Haskell, Donald M., to Phillips Petroleum Company. Hydrovisbreaking process for hydrocarbon containing feed streams. 4,592,830, Cl. 208-94.000.
Howkins, Stuart D., to Exxon Research and Engineering Co. Method for operating an ink jet device to obtain high resolution printing. 4,593,291, Cl. 346-1.100.
Hoya Corporation: *See—*
Amano, Satoru; Horiuchi, Shigenori; and Shinohara, Takeru, 4,592,621, Cl. 350-358.000.
HRI, Inc.: *See—*
Ganguli, Partha S., 4,592,826, Cl. 208-407.000.
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, to University of Miami. Treatment of skin over androgenicity using compositions containing pregnenolone. 4,593,021, Cl. 514-182.000.
Hsieh, Shane; and Mitchell, Wayne A., to American Hoechst Corporation. Developer compositions for lithographic plates. 4,592,992, Cl. 430-309.000.
Huang, I-Der: *See—*
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,593,141, Cl. 568-454.000.
Huang, Jamin: *See—*
Wu, Tai-Teh; Huang, Jamin; and Manning, David T., 4,592,774, Cl. 71-90.000.
Huang, Judith. Dual-purpose cutter and clipper for sponge cake. 4,592,139, Cl. 30-114.000.
Huber, Jakob. Gas turbine engine with pulverized coal firing. 4,592,199, Cl. 60-226.100.
Hughes Aircraft Company: *See—*
Du Pont, Preston S.; and Bilow, Norman, 4,592,925, Cl. 427-74.000.
Lee, William W. Y.; Shaw, Gareth L.; Clayton, James W., deceased; and Bachino, Denise, administrator, 4,592,132, Cl. 29-590.000.
Lucas, Charles H.; and Mulligan, James H., Jr., 4,593,250, Cl. 330-107.000.
Nash, Greg, 4,592,130, Cl. 29-577.00C.
Slayman, Charles W.; and Figueroa, Luis, 4,593,304, Cl. 357-30.000.
Hughes, Brett A.; and Gilbert, David L., to Aeroquip Corporation. Hose and clamp cap. 4,592,575, Cl. 285-252.000.
Hughes, Gregory G., to Modine Manufacturing Company. Reinforced plate fin heat exchanger. 4,592,420, Cl. 165-151.000.
Hughes Tool Company: *See—*
Morgan, Arvid E., 4,592,427, Cl. 166-369.000.
Neely, Stephen A., 4,592,426, Cl. 166-347.000.
Huignard, Jean-Pierre; and Arditty, Herve , to Thomson CSF. Holographic recording and related reading process. 4,592,618, Cl. 350-3.610.
Hujer, Friedrich: *See—*
Freitag, Friedbert; Hujer, Friedrich; Nagel, Erich; Payrhammer, Bernd; and Zahn, Wolfgang, 4,592,649, Cl. 355-43.000.
Hundebol, Soren, to F. L. Smidth & Co. A/S. Method of removing cadmium from raw phosphate. 4,592,900, Cl. 423-167.000.
Hunt, Joseph L.: *See—*
Pearman, William O.; Hunt, Joseph L.; and Cunningham, William P., 4,592,770, Cl. 65-128.000.
Hunter, Stanley M.; and Oujiri, Steven L., to Sierracin Corporation. Low temperature laminatable polyurethane. 4,592,947, Cl. 428-212.000.
Huray, Istvan. Multiple workholding clamp assembly and attachment means. 4,592,541, Cl. 269-155.000.
Huszarik, Fred A.: *See—*
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., 4,592,721, Cl. 425-558.000.
Hutchins, Alma A.; Hutchins, Donald H.; and Boord, Ronald, to Hutchins Manufacturing Company. Orbital abrading or polishing tool. 4,592,170, Cl. 51-170.0MT.
Hutchins, Donald H.: *See—*
Hutchins, Alma A.; Hutchins, Donald H.; and Boord, Ronald, 4,592,170, Cl. 51-170.0MT.
Hutchins Manufacturing Company: *See—*
Hutchins, Alma A.; Hutchins, Donald H.; and Boord, Ronald, 4,592,170, Cl. 51-170.0MT.
Hutter, Wilhelm: *See—*
Oesterle, Gerhard; and Hutter, Wilhelm, 4,593,236, Cl. 318-7.000.
Hyams, Bernard H.: *See—*
Shapiro, Stephen; Hyams, Bernard H.; Parker, Sherwood; and Walker, James, 4,593,381, Cl. 365-45.000.
Hyde, James S.; Froncisz, Wojciech; and Lai, Ching-San, to Medical College of Wisconsin, Inc., The. Oxymeter. 4,593,248, Cl. 324-317.000.

Hydril Company: *See—*
Hopkins, John F., 4,592,558, Cl. 277-205.000.
Hyosu, Yoshihiko: *See—*
Takagi, Seiichi; Hyosu, Yoshihiko; and Sasakawa, Masumi, 4,592,990, Cl. 430-137.000.
IBM Business Machines Corporation: *See—*
Willcox, Frederick P., 4,593,216, Cl. 310-49.000.
Ibrahim, Abd-El-Fattah A.: *See—*
Kadedodi, Narayan K.; Sheu, Shey-Ping L.; and Ibrahim, Abd-El-Fattah A., 4,593,319, Cl. 358-213.000.
Ichihara, Yoshihiro: *See—*
Tsuji, Masao; Mori, Fumio; and Ichihara, Yoshihiro, 4,592,868, Cl. 260-397.100.
Ichihashi, Hiroo: *See—*
Matsufuji, Yohji; and Ichihashi, Hiroo, 4,593,295, Cl. 346-140.00R.
Ichikawa, Takeo: *See—*
Fujimori, Kyoichi; and Ichikawa, Takeo, 4,592,327, Cl. 123-502.000.
Ichikawa, Yoshio: *See—*
Toda, Masaaki; and Ichikawa, Yoshio, 4,592,495, Cl. 222-526.000.
Ichino, Shuichi; Higuchi, Zenichi; and Kuroki, Motoharu, to Fuji Photo Film Co., Ltd. Film manufacturing method for improved surface smoothness. 4,592,885, Cl. 264-171.000.
ICI Americas Inc.: *See—*
Stephen, John F.; and Smith, Jerry H., 4,593,057, Cl. 524-111.000.
Ida, Masatoshi, to Olympus Optical Company Limited. Apparatus and method for detecting focus condition of an imaging optical system. 4,593,188, Cl. 250-204.000.
Ide, Toshiaki: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,592,942, Cl. 428-148.000.
Idemitsu Petrochemical Co., Ltd.: *See—*
Ogawa, Kenji, 4,592,739, Cl. 493-415.000.
IGT: *See—*
Paulsen, Craig A.; and Meier, Thomas R., 4,592,377, Cl. 133-5.00R.
Ikeda, Kenji; Hayashi, Takayuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,593,298, Cl. 346-200.000.
Ikeda, Kensuke: *See—*
Ikeda, Kenji; Hayashi, Takayuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,593,298, Cl. 346-200.000.
Ikeda, Tadashi: *See—*
Yoshida, Tetsuo; Kokubo, Tadayoshi; Adachi, Keiichi; Ikeda, Tadashi; and Kobayashi, Hidetoshi, 4,592,991, Cl. 430-139.000.
Ikeda, Takashi; Sawayama, Noboru; and Akamatsu, Hiroyuki, to Ricoh Company, Ltd. Dry process developing apparatus. 4,592,653, Cl. 355-3.0DD.
Ikezaki, Katuzi; and Ishii, Kiyoshi, to Sharp Kabushiki Kaisha. Vacuum cleaner. 4,592,764, Cl. 55-276.000.
Ikita, Takao: *See—*
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Ilco Unican Inc.: *See—*
Fish, Aaron M.; Dausseing, Jean-Paul; and Mayzels, Leon, 4,592,453, Cl. 192-0.02R.
Ilgner, Hartmut; Thiagarajan, Natarajan; Heck, Gunter; and Lienerth, Aladar, to Uhde GmbH. Process for the production of grade AA methanol. 4,592,806, Cl. 203-71.000.
Illinois Tool Works Inc.: *See—*
Walters, Peter J.; and Weaver, William N., 4,592,466, Cl. 206-150.000.
Imai, Eiichi: *See—*
Mitsuhashi, Yasuo; Takenouchi, Masanori; Okado, Kenji; Imai, Eiichi; and Suematsu, Koshi, 4,592,987, Cl. 430-102.000.
Imaizumi, Masaru; and Tanaka, Kenzou, to Minolta Camera Kabushiki Kaisha. Developing material amount detecting apparatus. 4,592,642, Cl. 355-3.0DD.
Imperial Chemical Industries Plc: *See—*
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,593,138, Cl. 585-481.000.
Imran, Mir, to Mirowski, Mieczyslaw. Apparatus and method for digital rate averaging. 4,592,367, Cl. 128-706.000.
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Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Scroll compressor. 4,592,703, Cl. 417-366.000.
Inami, Shunichi: *See—*
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.
Inata, Tsuguo; and Sasa, Shigehiko, to Fujitsu Limited. High electron mobility semiconductor device employing selectively doped hetero-junction and dual, undoped spacer layers. 4,593,301, Cl. 357-22.000.
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Wilcox, Thomas J., 4,592,388, Cl. 137-615.000.
Ing. Alfred Schmidt GmbH: *See—*
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Ing. C. Olivetti & C., S.p.A.: *See—*
Dagna, Giandomenico, 4,593,296, Cl. 346-140.00R.
Inmos Corporation: *See—*
Bourassa, Ronald R., 4,592,128, Cl. 29-571.000.
Inoue, Akira; and Otsuka, Tadao, to Kyokuto Kaihatsu Kogyo Co, Ltd.; and Hitachi Metals, Ltd. Coupling mechanism for king pin. 4,592,566, Cl. 280-433.000.
Inoue, Hideaki: *See—*
Murakami, Terukiyo; Tamura, Minoru; and Inoue, Hideaki, 4,592,322, Cl. 123-361.000.
Inoue, Hiroshi; Sezume, Tadashi; and Sei, Kazuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Production of polyolefin copolymer. 4,592,960, Cl. 428-461.000.
Inoue, Mituji: *See—*
Uno, Shinichi; Suzuki, Etsuji; Douji, Ryuhachirou; and Inoue, Mituji, 4,593,309, Cl. 358-10.000.
Instance, David J. Resealable container labels. 4,592,572, Cl. 281-2.000.
Institut Francais du Petrole: *See—*
Bienfait, Michel; Durand, Bernard; Suzanne, Jean; and Ungerer, Philippe, 4,593,195, Cl. 250-253.000.
Institut Technique des Cereales et des Fourrages: *See—*
Pregermain, Jacques, 4,592,484, Cl. 221-13.000.
Institute of Gas Technology: *See—*
Babu, Suresh P.; Anderson, Gerald L.; and Nandi, Satyendra P., 4,592,762, Cl. 48-197.00R.
Intermedicat GmbH: *See—*
Braun, Karl; and Fetzer, Jurgen, 4,592,498, Cl. 227-19.000.
International Business Machines: *See—*
Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., 4,592,628, Cl. 350-486.000.
International Business Machines Corporation: *See—*
Amelio, William J.; Jung, Dae Y.; Markovich, Voya; and Sambucetti, Carlos J., 4,593,016, Cl. 502-339.000.
Anderson, Nathaniel C.; Daby, Larry E.; Johnson, Gene A.; and McCaffrey, Patrick M., 4,593,334, Cl. 360-126.000.
Bergeron, Paul H.; Carpenter, Kurt D.; Hickson, Jerome B., Jr.; Jackson, Roger K.; Lallier, Keith W.; and Malone, Elba K., 4,593,362, Cl. 364-488.000.
Burstein, Michael; Hong, Se J.; and Pelavin, Richard N., 4,593,363, Cl. 364-491.000.
Castel, Rene; Calvignac, Jean-Louis; and Draper, Wilburn D., 4,593,352, Cl. 364-200.000.
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,592,944, Cl. 428-195.000.
Coburn, Ronald L., 4,593,254, Cl. 331-1.00A.
Desblache, Andre ; Galand, Claude; and Vermot-Gauchy, Robert, 4,593,161, Cl. 179-170.200.
Frank, Edgar H.; and Komplin, Steven R., 4,592,670, Cl. 400-637.600.
Hong, Se J.; Nair, Ravindra K.; and Shapiro, Eugene, 4,593,351, Cl. 364-200.000.
Hovel, Harold J.; and McKoy, Thermon E., 4,592,793, Cl. 148-189.000.
Konishi, Akira; and Matsuura, Shigeru, 4,593,407, Cl. 382-46.000.
Meyerson, Bernard S.; Plecenik, Richard M.; and Scott, Bruce A., 4,592,933, Cl. 427-255.100.
Rupprecht, Hans S.; and Tiwari, Sandip, 4,593,307, Cl. 357-67.000.
International Flavors & Fragrances Inc.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,593,143, Cl. 568-665.000.
International Fuel Cells Corporation: *See—*
Taylor, William A., 4,592,968, Cl. 429-34.000.
International Harvester Company: *See—*
Wilson, Barri L.; Fasick, Ernest J.; King, James H.; and Leitzman, Noel E., 4,592,442, Cl. 180-247.000.
International Minerals & Chemical Corp.: *See—*
Lu, Jing-jong; and Wehrmeister, Herbert L., 4,593,024, Cl. 514-234.000.
International Rectifier Corporation: *See—*
Lidow, Alexander; and Herman, Thomas, 4,593,302, Cl. 357-23.400.
Intevep, S.A.: *See—*
Galiasso, Roberto; Salazar, Jose A.; Morales, Alfredo; and Carrasquel, Angel R., 4,592,827, Cl. 208-59.000.
Irikura, Tsutomu; Takagi, Koichi; Fujimori, Shizuyoshi; and Hirata, Yoshihiro, to Kyorin Pharmaceutical Co., Ltd. Class of spiro-linked pyrrolidine-2,5-diones. 4,593,092, Cl. 544-6.000.
Irving, Edward, to Ciba-Geigy Corporation. Polymerizable compositions containing diphenyliodosyl salts. 4,593,052, Cl. 522-31.000.
Isayama, Katsuhiko: *See—*
Hirose, Toshifumi; and Isayama, Katsuhiko, 4,593,068, Cl. 525-100.000.
Ishibashi, Yukio: *See—*
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Ishida, Keizo; Ohshima, Yoshikuni; Mukaidani, Toyoyuki; Okouchi, Isao; and Izumi, Kenkichi, to Hitachi, Ltd. Condenser. 4,592,419, Cl. 165-112.000.
Ishidoshiro, Hiroshi: *See—*
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Ishihara, Toshinobu: *See—*
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Ishii, Kiyoshi: *See—*
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Ishikawa, Masahiro: *See—*
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, 4,592,651, Cl. 355-72.000.

Ishikura, Tomoyuki: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Kouno, Kageaki; Ishikura, Tomoyuki; Yoshimoto, Akihiro; Takatsuki, Yukio; and Tobe, Hiroyasu, 4,592,999, Cl. 435-78.000.

Ising, James O.: *See—*
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Isono, Hiroyuki; and Kurosawa, Mutsuo, to Tachikawa Spring Co., Ltd. Vehicle seat. 4,592,588, Cl. 297-284.000.

Isover Saint-Gobain: *See—*
Lemaignen, Henry, 4,592,769, Cl. 65-4.400.

Itai, Yasushi: *See—*
Matsuki, Ikuo; Itai, Yasushi; and Nakamura, Kenji, 4,592,458, Cl. 192-83.000.

Itakura, Mithuo: *See—*
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.

Itemadani, Eiji: *See—*
Tanaka, Souhei; Mori, Kazuhiro; and Itemadani, Eiji, 4,592,137, Cl. 29-843.000.

Ito, Toshimitsu: *See—*
Kobayashi, Nobuyuk; Hattori, Takashi; and Ito, Toshimitsu, 4,592,315, Cl. 123-188.00M.

Itou, Isao: *See—*
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ITT Corporation: *See—*
Biswas, Dipak R.; and Raychaudhuri, Satyabrata, 4,592,932, Cl. 427-163.000.
Martin, Philip T., 4,593,156, Cl. 179-16.0AA.
Slack, Thomas B.; and Denenberg, Jeffrey N., 4,593,367, Cl. 364-513.000.

ITT Industries, Inc.: *See—*
Belart, Juan, 4,592,599, Cl. 303-119.000.

Ivac Corporation: *See—*
Georgi, Heinz W., 4,592,365, Cl. 128-680.000.

Ivanov, Boris G.: *See—*
Zarogatsky, Leonid P.; Ivanov, Nikolai A.; Korolkov, Mikhail F.; Laubgan, Villi R.; Safronov, Andrei N.; Turkin, Vladimir Y.; and Ivanov, Boris G., 4,592,517, Cl. 241-207.000.

Ivanov, Nikolai A.: *See—*
Zarogatsky, Leonid P.; Ivanov, Nikolai A.; Korolkov, Mikhail F.; Laubgan, Villi R.; Safronov, Andrei N.; Turkin, Vladimir Y.; and Ivanov, Boris G., 4,592,517, Cl. 241-207.000.

Iversen, Arthur H. Liquid cooled rotating seals. 4,592,557, Cl. 277-80.000.

Ivony nee Kaldive, Katalin: *See—*
Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, 4,593,004, Cl. 435-181.000.

Iwahashi, Hiroshi; and Asano, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor integrated circuit which allows adjustment of circuit characteristics in accordance with storage data of nonvolatile memory element. 4,593,203, Cl. 307-202.100.

Izumi, Kenkichi: *See—*
Ishida, Keizo; Ohshima, Yoshikuni; Mukaidani, Toyoyuki; Okouchi, Isao; and Izumi, Kenkichi, 4,592,419, Cl. 165-112.000.

Izumisawa, Yoshiaki: *See—*
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J. M. Huber Corporation: *See—*
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J. M. Voith, GmbH: *See—*
Musselmann, Walter; Bahr, Theodor; and Thumm, Helmut, 4,592,513, Cl. 241-46.170.

Jabs, Gert: *See—*
Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., 4,592,957, Cl. 428-402.210.

Jacinto, Jose-Maria. Heel construction. 4,592,153, Cl. 36-38.000.

Jacks, R. Keith: *See—*
Hart, James A.; and Jacks, R. Keith, 4,592,480, Cl. 220-270.000.

Jackson, Robert C.; and Luchsinger, Patrick M., to Deere & Company. Machine for molding elongated workpieces. 4,592,716, Cl. 425-330.000.

Jackson, Roger K.: *See—*
Bergeron, Paul H.; Carpenter, Kurt D.; Hickson, Jerome B., Jr.; Jackson, Roger K.; Lallier, Keith W.; and Malone, Elba K., 4,593,362, Cl. 364-488.000.

Jacob, Keith, to Multi-Elmac Company. Integrated oscillator antenna for low power, low harmonic radiation. 4,593,412, Cl. 455-129.000.

Jacob, Manfred; and Tews, Fritz, to Gesellschaft fuer Nukleartechnik mbH. Apparatus for the packaging of contaminated waste materials. 4,592,192, Cl. 53-512.000.

Jacobs, Edward C.: *See—*
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,592,668, Cl. 400-127.000.

Jacobs Manufacturing Company, The: *See—*
Meistrick, Zdenek S., 4,592,319, Cl. 123-321.000.

Jacobson, Allan J.; Johnson, Jack W.; and Lewandowski, Joseph T., to Exxon Research and Engineering Co. Layered compounds of perovskite related oxides and organic bases. 4,593,013, Cl. 502-167.000.

Jacuzzi Inc.: *See—*
Robertson, Joeab A.; Waldorf, Virgil J.; Wilkes, Robert D.; and Pucket, Joe D., 4,592,100, Cl. 4-492.000.

Jagger, Janine C.; Pearson, Richard D.; Guyenet, Patrice G.; and Brand, Jessica J., to University of Virginia Alumni Patents Foundation, The. Self-resheathing needle assembly. 4,592,744, Cl. 604-192.000.

Jagunich, Douglas M.: *See—*
Clifford, Mark J.; Hock, Robert H.; Jagunich, Douglas M.; and Robinson, Paul J., 4,593,284, Cl. 340-870.180.

James River-Dixie/Northern, Inc.: *See—*
Kuchenbecker, Morris W., 4,592,914, Cl. 426-107.000.

Jansons, Viktors; and Gors, Heinrich C., to Raychem Corporation. Preparation of aromatic ketone-sulfone copolymers. 4,593,086, Cl. 528-173.000.

Japan Crown Cork Co., Ltd.: *See—*
Yasada, Seikuro, 4,592,476, Cl. 215-252.000.

Japan Tobacco & Salt Public Corporation, The: *See—*
Nagata, Tomizou; Sakakibara, Kouzou; and Sakano, Makoto, 4,592,244, Cl. 74-57.000.

Japan Vilene Co., Ltd.: *See—*
Nakao, Etsuro, 4,592,815, Cl. 204-165.000.

Jarrow Products, Inc.: *See—*
Gerritsen, John T., 4,592,180, Cl. 52-203.000.

Jasinski, Donald W. Apparatus for distributing a stack of roof panels atop a roof. 4,592,536, Cl. 254-8.00R.

Jasinski, Stan K.: *See—*
Golob, Theodore B.; Gilles, Wim; Jasinski, Stan K.; and Whitehead, Patrick B. G., 4,592,398, Cl. 144-3.00D.

Jastrzebski, Lubomir L.: *See—*
Corboy, John F., Jr.; and Jastrzebski, Lubomir L., 4,592,792, Cl. 148-175.000.

Jenkins, Waylon L.: *See—*
Dombroski, John R.; and Jenkins, Waylon L., 4,593,082, Cl. 526-216.000.

Jensen, Michael L.; and Claunch, Carney P., II, to Raychem Corporation. Heating element having deformed buss bars. 4,593,181, Cl. 219-541.000.

Jermansen, Torris G.: *See—*
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,593,141, Cl. 568-454.000.

Jevne, Allan H.; Vegoe, Brett R.; Holmblad, Carolann M.; and Cahalan, Patrick T., to Medtronic, Inc. Hydrophilic pressure sensitive biomedical adhesive composition. 4,593,053, Cl. 523-111.000.

Jidosha Kiki Co., Ltd.: *See—*
Takeshima, Sadao; and Ohe, Takeshi, 4,593,358, Cl. 364-424.000.

Joachim, Arnold: *See—*
Tamm, Franz; Hoericke, Bernhard; and Joachim, Arnold, 4,592,788, Cl. 148-12.00B.

John, Gunter; Kretschmer, Karl-Heinz; Schumacher, Horst; and Rollich, Jurgen, to VEB Kombinat Fortschritt-Landmaschinen. Field chopper with adjustable fan assist. 4,592,514, Cl. 241-55.000.

John Lysaght Australia Limited: *See—*
Summers, Warwick R.; and Cross, Rodney C., 4,593,244, Cl. 324-230.000.

John Wyeth & Brother Ltd.: *See—*
Crossley, Roger, 4,593,111, Cl. 556-410.000.

Johns Hopkins University, The: *See—*
Parker, John G.; and Stanbro, William D., 4,592,361, Cl. 128-633.000.
Snyder, Solomon H.; Daly, John W.; and Bruns, Robert F., 4,593,095, Cl. 544-272.000.

Johns-Manville Corporation: *See—*
Sherman, Earle C.; and Green, James B. P., Jr., 4,592,190, Cl. 53-491.000.

Johnson, Gene A.: *See—*
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Johnson, Jack W.: *See—*
Jacobson, Allan J.; Johnson, Jack W.; and Lewandowski, Joseph T., 4,593,013, Cl. 502-167.000.

Johnson, Lawrence N., to EZ Loader Boat Trailers, Inc. Modular boat trailer. 4,592,694, Cl. 414-534.000.

Johnson, M. Anthony, to Dow Chemical Company, The. Composition useful for stripping photoresist polymers and method. 4,592,787, Cl. 134-38.000.

Johnson, Mark R., to Dow Chemical Company, The. Polyoxazoline compounds. 4,593,103, Cl. 548-239.000.

Johnson, Marvin M.; Nowack, Gerhard P.; and McDaniel, Max P., to Phillips Petroleum Company. Isomerization process and catalyst therefor. 4,593,146, Cl. 585-667.000.

Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Process for removal of arsine impurities from gases containing arsine and hydrogen sulfide. 4,593,148, Cl. 585-823.000.

Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Pharmacologically active 4-[2-hydroxy-4-(substituted)phenyl]naphthalen-2(1H)-ones and 2-ols, derivatives thereof and intermediates therefor. 4,593,131, Cl. 568-632.000.

Johnson, Robert R.: *See—*
Yaniv, Zvi; and Johnson, Robert R., 4,593,199, Cl. 250-484.100.

Jolley, Michael E.: *See—*
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,593,089, Cl. 536-13.600.

Jolly, Stuart T., to RCA Corporation. Vapor phase deposition apparatus. 4,592,307, Cl. 118-719.000.

Jonasson, Kevin A.: *See*—
Capes, Charles E.; Bennett, Adam J.; Jonasson, Kevin A.; and Thayer, William L., 4,592,506, Cl. 239-139.000.

Jones, Gordon H.; Venuti, Michael C.; and Young, John M., to Syntex (U.S.A.) Inc. Naphthalene anti-psoriatic agents. 4,593,120, Cl. 560-107.000.

Jones, Keith N.: *See*—
Cousins, Steven J.; Jones, Keith N.; and Ackerley, Kenneth E., 4,592,587, Cl. 297-284.000.

Jones, Mary Ann; and Arends, Charles B., to Dow Chemical Company, The. High gloss, impact resistant polymer resins for injection molding. 4,593,063, Cl. 524-505.000.

Jonsson, Bengt: *See*—
Borel, Georg; and Jonsson, Bengt, 4,592,396, Cl. 139-425.00A.

Jornhagen, Lennart, to Forsheda AB. Sealing device for sealing a bearing. 4,592,666, Cl. 384-477.000.

Jost, Leonora, to Vortex Research Corp. Yoghurt based douche kit and assembly therefor. 4,592,748, Cl. 604-279.000.

Judge, Alfred H., to Black & Decker Inc. Offset electric stapler. 4,592,502, Cl. 227-131.000.

Juergens, Tristan; and Tesch, Hugo, to Gates Energy Products, Inc. Vibration-resistant battery assembly. 4,592,972, Cl. 429-160.000.

Jun-Ichi Nishizawa: *See*—
Nishizawa, Jun-ichi; and Tamamushi, Takashige, 4,593,320, Cl. 358-213.000.

Jung, Dae Y.: *See*—
Amelio, William J.; Jung, Dae Y.; Markovich, Voya; and Sambucetti, Carlos J., 4,593,016, Cl. 502-339.000.

Jurgutis, John A. Orthopedic staple. 4,592,346, Cl. 128-92.00B.

KabiVitrum AB: *See*—
Hjertman, Birger T.; and Bennwik, Percy E., 4,592,743, Cl. 604-82.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Tuda, Goro; Kada, Hironosuke; Sekino, Teruyoshi; and Nagahama, Yasuhide, 4,592,697, Cl. 414-719.000.

Kabushiki Kaisha Toka-rika-denki-seisakusho: *See*—
Kawaguchi, Teruhiko, 4,592,520, Cl. 242-107.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,592,529, Cl. 248-475.100.
Yamaguchi, Terumoto; and Terashima, Tuneo, 4,592,407, Cl. 164-265.000.

Kabushiki Kaisha Toshiba: *See*—
Deie, Toshikazu, 4,592,131, Cl. 29-588.000.
Kurata, Mamoru; and Yoshida, Jiro, 4,593,305, Cl. 357-34.000.
Matsutani, Kinya; and Sasaki, Katsutoki, 4,592,895, Cl. 422-106.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Sakata, Masataka; and Asano, Masakazu, 4,592,449, Cl. 187-9.00E.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Yamamoto, Munemitsu; and Hitotsuya, Ryoichi, 4,592,892, Cl. 422-28.000.

Kada, Hironosuke: *See*—
Tuda, Goro; Kada, Hironosuke; Sekino, Teruyoshi; and Nagahama, Yasuhide, 4,592,697, Cl. 414-719.000.

Kadedodi, Narayan K.; Sheu, Shey-Ping L.; and Ibrahim, Abd-El-Fattah A., to Xerox Corporation. High resolution quadrilinear CCD imager with four channel to one channel multiplexing. 4,593,319, Cl. 358-213.000.

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Kaeding, Warren W.; and Lee, Carol S., to Mobil Oil Corporation. ZSM-5/ZSM-12 catalyst mixture for cracking alkylbenzenes. 4,593,136, Cl. 585-446.000.

Kaiser, Donald B.: *See*—
McDonie, Arthur F.; and Kaiser, Donald B., 4,593,229, Cl. 313-533.000.

Kajima Corporation: *See*—
Sugita, Kiyoshi; and Nakanishi, Hiroshi, 4,592,413, Cl. 165-59.000.

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Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,593,094, Cl. 544-224.000.

Kamp, Arthur J.: *See*—
Bon, Charles K.; Kamp, Arthur J.; and Sobieralski, Theodore J., 4,592,810, Cl. 204-59.00R.

Kanai, Kenichi; Shimoe, Osamu; and Tashiro, Sadaji, to Hitachi Metals, Ltd. Apparatus for controlling concentration of toner in developer. 4,592,645, Cl. 355-14.00D.

Kanayama, Tatsuo: *See*—
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Kanbe, Junichiro: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,592,985, Cl. 430-84.000.

Kanda, Hajime; Murase, Katsuo; Hishida, Hiroshi; Adachi, Eiichi; Wada, Yoshinori; and Koseki, Yuji, to Ricoh Company, Ltd. Facsimile system control apparatus. 4,593,323, Cl. 358-256.000.

Kando, Akiyoshi, to Yoshida Kogyo K. K. Apparatus for automatically closing a slide fastener. 4,592,135, Cl. 29-766.000.

Kaneda, Naoya; and Matsuda, Kazuya, to Canon Kabushiki Kaisha. Automatic focus adjusting device. 4,592,638, Cl. 354-403.000.

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Hirose, Toshifumi; and Isayama, Katsuhiko, 4,593,068, Cl. 525-100.000.

Kannapell, Henry N.; and Bobick, Thomas W., to Mead Corporation, The. Adaptive threshold document duplication. 4,593,325, Cl. 358-282.000.

Kanner, Bernard: *See*—
Lewis, Kenrick M.; and Kanner, Bernard, 4,593,114, Cl. 556-450.000.

Kanotz, William M.: *See*—
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,592,955, Cl. 428-389.000.

Kant, Bernhard, to VDO Adolf Schindling AG. Device for the electric measurement of a liquid level. 4,592,231, Cl. 73-295.000.

Kapler, Albert W. Apparatus for preventing the twisting of an electrical cord or cable. 4,592,605, Cl. 339-8.00R.

Karapita, Alexander D. Overhead trolley. 4,592,527, Cl. 248-318.000.

Karino, Kimiji; and Tanabe, Yoshiyuki, to Hitachi, Ltd. Fuel injection apparatus. 4,592,326, Cl. 123-494.000.

Karoly, David E.: *See*—
Hildebrand, David B.; and Karoly, David E., 4,593,390, Cl. 370-112.000.

Karpa, Michael J. Monolithically cast concrete weighbridge. 4,592,435, Cl. 177-132.000.

Kasai, Junichi; and Saito, Takehiko, to Nissan Motor Company, Limited; and Niles Parts Company, Limited. Electrical connector. 4,592,609, Cl. 339-42.000.

Kataoka, Hiroyuki: *See*—
Ohkubo, Tetsuo; and Kataoka, Hiroyuki, 4,593,324, Cl. 358-261.000.

Kato, Masami, to Toska Co., Ltd. Apparatus for dispensing fasteners. 4,592,499, Cl. 227-67.000.

Kato, Masami, to Toska Co., Ltd. Tag-pin dispensing machine. 4,592,500, Cl. 227-67.000.

Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, to Canon Kabushiki Kaisha. View finder optical system. 4,592,636, Cl. 354-225.000.

Kato, Yoshiei: *See*—
Fujii, Tetsuya; Harada, Nobuo; Takeuchi, Shuji; Kato, Yoshiei; Nakamura, Hideo; Sakuraya, Toshikazu; and Habu, Yasuhiro, 4,592,778, Cl. 75-59.220.

Katoh, Kazunori; and Nagao, Yasuhiro, to Nippondenso Co., Ltd. Reduction type starter. 4,592,243, Cl. 74-7.00E.

Katzen, Stanley J.: *See*—
Rekers, Louis J.; and Katzen, Stanley J., 4,593,070, Cl. 526-100.000.

Kauffman, Martin H., to United States of America, Navy. Synthesis of transition metal dithiene complexes. 4,593,113, Cl. 556-136.000.

Kaufman, Charles D.: *See*—
Reinert, Raymond L.; and Kaufman, Charles D., 4,592,785, Cl. 134-18.000.

Kaufmann, Friedrich, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for vitrifying radioactive waste solutions. 4,592,898, Cl. 422-159.000.

Kaufmann, Robert; and Kring, Wilhelm, to Mannesmann Aktiengesellschaft. Strand guide for multi-strand metal casting apparatus. 4,592,409, Cl. 164-442.000.

Kawaguchi, Teruhiko, to Kabushiki Kaisha Toka-rika-denki-seisakusho. Webbing tension device. 4,592,520, Cl. 242-107.000.

Kawakami, Yoshinobu: *See*—
Higashiguchi, Teruaki; Miyakawa, Nobuhiro; Yano, Koji; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,592,643, Cl. 355-3.00R.

Kawamo, Yakichiro; Suga, Yozo; Nozawa, Tadao; and Nakayama, Tadashi, to Nippon Steel Corporation. Process for producing a grain-oriented electromagnetic steel sheet or strip. 4,592,789, Cl. 148-111.000.

Kawamoto, Isao: *See*—
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, 4,593,097, Cl. 544-347.000.

Kawasaki, Sinjiro; Kitagawa, Hideo; and Nishii, Yutaka, to Taoka Chemical Company, Limited. Dye solution composition. 4,592,756, Cl. 8-527.000.

Kawasaki Steel Company: *See*—
Fujii, Tetsuya; Harada, Nobuo; Takeuchi, Shuji; Kato, Yoshiei; Nakamura, Hideo; Sakuraya, Toshikazu; and Habu, Yasuhiro, 4,592,778, Cl. 75-59.220.

Kawasaki, Tetsuji; Miyoshi, Noriomi; and Tachibana, Yukimasa, to Warner-Lambert K.K.; Fuji Electric Company Ltd.; and Fuji Elmes Co., Ltd. Apparatus for inspecting capsules. 4,593,190, Cl. 250-223.00R.

Kawata, Shunichi: *See*—
Kamagata, Kazuo; Yamada, Toshiaki; Kawata, Shunichi; and Mizui, Takashi, 4,593,069, Cl. 525-113.000.

Kay, Dennis M. Ostomy appliance. 4,592,750, Cl. 604-337.000.

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Kazmaier, Gunther: *See*—
Goller, Ernst; and Kazmaier, Gunther, 4,592,214, Cl. 66-149.00R.

Kehr, Wolfgang; Schroder, Gertrud; Stock, Gunter; and Wachtel, Helmut, to Schering Aktiengesellschaft. Terguride as antihypertensive. 4,593,032, Cl. 514-288.000.

Keinborg, Maurice; Langon, Bernard; and Chaffy, Joseph, to Aluminium Pechiney. Electrolysis tank with a current strength of greater than 250,000 amperes for the production of aluminum by means of the Hall-Heroult process. 4,592,821, Cl. 204-244.000.

Keith, Herman G., to Keith, Herman G.; and Keith, John M. Accessory pulley installation tool. 4,592,124, Cl. 29-264.000.
Keith, John M.: *See*—
Keith, Herman G., 4,592,124, Cl. 29-264.000.
Kellar, Paul R. N.; and Long, Robert J., to Micro Consultants Limited. Image processing system. 4,593,316, Cl. 358-140.000.
Kellerwessel, Hans: *See*—
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Kelley, Stephen H.: *See*—
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Kelsey-Hayes Company: *See*—
Gray, Gary L.; and Gajda, Leo P., 4,592,121, Cl. 29-159.100.
Kemmerer, Klemens, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet gripper for a printing machine. 4,592,279, Cl. 101-412.000.
Kemp-Carraway Heart Institute, The: *See*—
Siler, William M., 4,593,314, Cl. 358-112.000.
Kemp, Linwood B.: *See*—
Layman, Robert G.; and Kemp, Linwood B., 4,592,844, Cl. 210-709.000.
Kempas, Hagen, to Bodenseewerk Geratetechnik GmbH. Dynamically tuned gimbal suspension with flexural pivots for a two-degree-of-freedom gyro. 4,592,242, Cl. 74-5.00F.
Kemplin, Steven C., to General Electric Company. Automatic correction of centering and convergence errors in CRT displays. 4,593,308, Cl. 358-10.000.
Keogh, Michael J., to Union Carbide Corporation. Water-curable, silane modified ethylene polymers. 4,593,071, Cl. 525-288.000.
Keogh, Michael J., to Union Carbide Corporation. Relatively water-stable compositions based on thermoplastic polymers containing pendant silane moieties. 4,593,072, Cl. 525-326.500.
Kernforschungsanlage Julich GmbH: *See*—
Eulenberg, Hannspeter; and Larue, Horst, 4,593,241, Cl. 323-294.000.
Kerr, Charles J. Vehicle identification and retrieval system. 4,592,157, Cl. 40-2.00A.
Kesling, Haven S., Jr.; and Gillman, Hyman D., to Atlantic Richfield Company. Alkoxylated ether sulfate anionic surfactants from plasticizer alcohol mixtures. 4,592,875, Cl. 252-551.000.
Ketelhut, William J.: *See*—
Kocher, Mark J.; Gareis, Ronald E.; Ketelhut, William J.; and Konrad, Charles E., 4,593,380, Cl. 364-900.000.
Khoe, Giok D.: *See*—
Kuppers, Paul D.; Schelhas, Karl H.; van den Brekel, Cornelis H. J.; and Khoe, Giok D., 4,592,924, Cl. 427-45.100.
Kikuta, Sigeru, to Hirose Electric Co., Ltd. Electric connector having cover case. 4,592,612, Cl. 339-143.00R.
Kim, Dong H., to American Home Products Corporation. 3A,4,7,7a-tetrahydro-3,6,7a-trimethyl-4-substituted phenyl-isoxazolo[5,4-b]pyridine-5-carboxylic acid esters. 4,593,100, Cl. 546-115.000.
Kimball International, Inc.: *See*—
Slaats, Mathew A.; and Strange, Patrick E., 4,592,590, Cl. 297-347.000.
Kimura, Akira, to Gogo Kimura. Novel nitrosourea compounds, method for preparing same, and pharmaceutical composition containing same. 4,593,090, Cl. 536-17.400.
Kimura, Tadashi: *See*—
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King, James H.: *See*—
Wilson, Barri L.; Fasick, Ernest J.; King, James H.; and Leitzman, Noel E., 4,592,442, Cl. 180-247.000.
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Seager, Richard H., 4,592,482, Cl. 220-318.000.
Kinneging, Hans: *See*—
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,592,803, Cl. 159-4.020.
Kishi, Norimasa; and Noso, Kazunori, to Nissan Motor Company, Limited. Speech recognition system and method for an automotive vehicle. 4,593,403, Cl. 381-43.000.
Kishi, Norimasa: *See*—
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Kishimoto, Taketoshi: *See*—
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Kita, Yasushi; Nakano, Hishaji; Moroi, Shiro; and Sakanoue, Akira, to Central Glass Co., Ltd. Process for producing a graphite fluoride. 4,593,132, Cl. 570-150.000.
Kitagawa, Fumio: *See*—
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Kitagawa, Hideo: *See*—
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Kittel, Friedrich, to Fichtel & Sachs AG. Clutch disc. 4,592,460, Cl. 192-106.200.
Kiuchi, Akihiro; and Tanaka, Shinichi, to Sharp Kabushiki Kaisha. Method and apparatus for producing n-bit outputs from an m-bit microcomputer. 4,593,373, Cl. 364-736.000.
Klebovich, Imre: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.
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Kleijne, Theodoor A., to NCR Corporation. Security device for the secure storage of sensitive data. 4,593,384, Cl. 365-228.000.
Klein, Jurgen: *See*—
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Klievoneit, Harold R.; and Esposito, Augustine G., to St. Florian Company, Ltd. Disc grinder with floating grinding wheel. 4,592,169, Cl. 51-118.000.
Klimek, Joseph P.: *See*—
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Kline, Donald D.: *See*—
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Klockner-Humboldt-Deutz AG: *See*—
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Knight, John C.: *See*—
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Knight, Lindsay C.; and Compton, Brian, to Lomah Electronic Targetry, Inc. Rifle training apparatus. 4,592,730, Cl. 434-22.000.
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Knofel, Hartmut; Penninger, Stefan; Hammen, Gunther; and Heitkamper, Peter, to Bayer Aktiengesellschaft. Process for the preparation of N- and O-substituted diurethanes and/or polyurethanes. 4,593,117, Cl. 560-025.000.
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Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, 4,592,597, Cl. 303-15.000.
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Kobayashi, Hidetoshi: *See*—
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Kobayashi, Nobuyuk; Hattori, Takashi; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Control device of an internal combustion engine. 4,592,315, Cl. 123-188.00M.
Kobayashi, Taishi; and Akase, Shinichiro, to Shin-Etsu Chemical Co., Ltd. Liquid detergent composition. 4,592,856, Cl. 252-162.000.
Kobayashi, Tetsuo: *See*—
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Kobelt, Jacob. Adjustable holding device. 4,592,526, Cl. 248-278.000.
Koch, Carl, to Sinar AG Schaffhausen. Apparatus to separate a single sheet from a stack of several similar sheets. 4,592,634, Cl. 354-105.000.
Kocher, Mark J.; Gareis, Ronald E.; Ketelhut, William J.; and Konrad, Charles E., to General Electric Co. Dual function input/output for a programmable controller. 4,593,380, Cl. 364-900.000.
Koga, Kazunori: *See*—
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Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, to TDK Corporation. Magnetic recording medium. 4,592,948, Cl. 428-216.000.
Koizumi, Yutaka, to Ricoh Company, Ltd. Copying machine using a photosensitive belt. 4,592,644, Cl. 355-3.0BE.
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Koleske, Joseph V., to Union Carbide Corporation. Photocopolymerizable compositons based on epoxy and polymer/hydroxyl-containing organic materials. 4,593,051, Cl. 522-31.000.
Kollmorgen Technologies Corporation: *See*—
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Komatsu, Koji; and Sakai, Sai, to New Cosmos Electric Co., Ltd. Gas sensor of mixed oxides. 4,592,967, Cl. 428-697.000.
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Konishi, Akira; and Matsuura, Shigeru, to International Business Machines Corporation. Pattern processing system. 4,593,407, Cl. 382-46.000.
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Koos, William M., Jr.; Geis, Timothy R.; and Rudy, Richard M., Jr., to Burroughs Corp. Real time graphic processor. 4,593,278, Cl. 340-748.000.
Kooymans, Petrus G.; Stachowiak, Stephen A.; Bekooij, Jurrianus; and Raudenbusch, Werner T., to Shell Oil Company. Polyglycidyl ethers, their preparation and their use in preparing thermosetting coating compositions. 4,593,078, Cl. 525-497.000.
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Kouyama, Toshitake, to NEC Corporation. Error correction circuit for digital audio signal. 4,593,392, Cl. 371-31.000.
Koyanagi, Yukio, to Matsushita Electric Industrial Co., Ltd. Programable channel selecting system. 4,593,414, Cl. 455-186.000.
Kraatz, Udo; Reiser, Wolf; Buchel, Karl H.; and Lurssen, Klaus, to Bayer Aktiengesellschaft. (−)-Antipode of (E)-1-cyclohexyl-4,4-dimethyl-3-hydroxy-2-(1,2,4-triazol-1-yl)-pent-1-ene. 4,592,772, Cl. 71-76.000.
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Kramer, Morton: *See*—
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Krause, Norbert, to Siemens Aktiengesellschaft. High-frequency device for nuclear spin resonance apparatus having a surface coil. 4,592,363, Cl. 128-653.000.
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Kristensson, Sten K.; and Stamvik, Anders R., to Aktiebolaget Leo. Selective acylation process. 4,592,869, Cl. 260-397.400.
Krol, Thijs; and van den Enden, Adrianus W. M., to U.S. Philips Corporation. Time division switching system. 4,593,387, Cl. 370-58.000.
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Krueger, David J., to Littelfuse, Inc. Time delay indicator fuse. 4,593,262, Cl. 337-163.000.
Krueger, Eberhart; and Kunsken, Helmut, to Wilhelm Fette GmbH. Method of and an arrangement for producing threads. 4,592,221, Cl. 72-84.000.
Krueger, William R.: *See*—
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Durr, Manfred; Unland, Georg; Wurr, Jurgen; and Vering, Antonius, 4,592,724, Cl. 432-78.000.
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ujita, Tsuginobu; and Takahashi, Seiichi, 4,592,440, Cl. 180-155.000.
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Lee, Andrew J., to Ebonite International, Inc. Bowling ball. 4,592,551, Cl. 273-63.00E.
Lee, Carol S.: *See*—
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Shapiro, Stephen; Hyams, Bernard H.; Parker, Sherwood; and Walker, James, 4,593,381, Cl. 365-45.000.
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Ilgner, Hartmut; Thiagarajan, Natarajan; Heck, Gunter; and Lienerth, Aladar, 4,592,806, Cl. 203-71.000.

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Heckman, Harold, 4,592,722, Cl. 432-13.000.

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Knight, Lindsay C.; and Compton, Brian, 4,592,730, Cl. 434-22.000.

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Long, Gerald R., to RCA Corporation. Apparatus for verifying the acceptability of the curvature of a curved object. 4,592,149, Cl. 33-550.000.

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Kellar, Paul R. N.; and Long, Robert J., 4,593,316, Cl. 358-140.000.

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Matt, Peter, 4,592,181, Cl. 52-223.00L.

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Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,593,138, Cl. 585-481.000.

Lu, Hsi H. Ground anchor. 4,592,178, Cl. 52-155.000.

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Smith, Thomas W.; Teegarden, David M.; McGrane, Kathleen M.; and Luca, David J., 4,592,989, Cl. 430-110.000.

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Taylor, Joseph D. F.; and Wiley, David, 4,593,233, Cl. 315-307.000.

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Jackson, Robert C.; and Luchsinger, Patrick M., 4,592,716, Cl. 425-330.000.

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Rhoe, Andrei; Pisani, Joseph A.; Hamilton, Gary L.; and Suciu, George D., 4,592,831, Cl. 208-309.000.

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Noreus, Sture; Lundberg, Hans; Uhlin, Lars; and Lindquist, Bengt, 4,592,804, Cl. 162-19.000.

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Gitlitz, Melvin H.; and Leiner, Howard H., 4,593,055, Cl. 523-122.000.

Maan, Mohammed N.: *See*—
Leach, Jerald G.; Maan, Mohammed N.; and Pradhan, Rakesh, 4,593,279, Cl. 340-811.000.

MacDermid, Incorporated: *See*—
Fong, Jaan J.; and Becking, Donald H., 4,592,809, Cl. 204-44.200.

Machine Technology, Inc.: *See*—
Rubin, Richard H.; and Hillman, Gary, 4,592,926, Cl. 427-82.000.

Macho, Heinz: *See*—
Poppe, Werner; van Rijekevorsel, Rainer; Ruppender, Uwe; and Macho, Heinz, 4,592,893, Cl. 422-56.000.

MacLean-Fogg Company: *See*—
Hlinsky, Emil J.; and Hellon, Keith, 4,592,601, Cl. 312-111.000.

MacLeod, Richard J.: *See*—
Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., 4,592,518, Cl. 242-78.700.

Madderra, Jimmy M.; and Schaeffel, John A., Jr., to United States of America, Army. Counter-rotating folding wings. 4,592,525, Cl. 244-3.280.

Maeda, Masahiko; Takashima, Masaharu; and Takeuchi, Masahira, to Sanyo Electric Co., Ltd. Food frying apparatus. 4,593,170, Cl. 219-10.55E.

Magill, Robert J.; and Gaiger, David J., to Actionair Equipment Limited. Damper blade. 4,592,535, Cl. 251-298.000.

Magnavox Government and Industrial Electronics Company: *See*—
Lao, Binneg Y.; and Rowe, David A., 4,593,243, Cl. 324-158.00P.

Magnes, Herbert. Liquid level control system. 4,592,098, Cl. 4-508.000.

Mahruki, Nimetullah M. T. Retraction device. 4,592,347, Cl. 128-127.000.

Mahruki, Nimetullah M. T. Vaginal sponge applicator. 4,592,740, Cl. 604-15.000.

Maierbacher, Joseph, to Dresser Industries, Inc. Clamping assembly. 4,592,699, Cl. 415-126.000.

Mailander, Engelbert: *See—*
Muller, Manfred; Nickel, Wilhelm; Schirmagg, Klaus-Peter; and Mailander, Engelbert, 4,592,222, Cl. 72-97.000.

Maiman, Mitchell H.: *See—*
Bruce, Clarence A.; Koh, Yoong G.; Matwey, Paul; Maiman, Mitchell H.; Chan, Wing C.; and DeFreest, Thomas J., 4,593,227, Cl. 313-482.000.

Main, W. Eric: *See—*
Neidorff, Robert A.; and Main, W. Eric, 4,593,206, Cl. 307-270.000.

Majewski, Henry A.: *See—*
Landau, Richard F.; and Majewski, Henry A., 4,592,800, Cl. 156-643.000.

Makino, Sakae, to Yamaha Hatsudoki Kabushiki Kaisha. Intake system for two-cycle multi-cylinder engines. 4,592,311, Cl. 123-73.00A.

Malhotra, Shadi L., to Xerox Corporation. Ink jet transparencies with coating compositions thereover. 4,592,954, Cl. 428-335.000.

Malik, Dev R., to Dresser Industries, Inc. Method and apparatus for minimizing effect of hard spots in rotating frame structure of mining machine on roller bearings. 4,592,667, Cl. 384-593.000.

Malone, Elba K.: *See—*
Bergeron, Paul H.; Carpenter, Kurt D.; Hickson, Jerome B., Jr.; Jackson, Roger K.; Lallier, Keith W.; and Malone, Elba K., 4,593,362, Cl. 364-488.000.

Maloney, James J.: *See—*
Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., 4,592,767, Cl. 62-31.000.

Malpass, Dennis B., to Exxon Research & Engineering Co. Polyethylene with broad molecular weight distribution. 4,593,010, Cl. 502-115.000.

Mammen, William R.; and Pietrowsky, Joseph P. Matrix category game. 4,592,553, Cl. 273-240.000.

Mang, Uli: *See—*
Baumann, Karl-Heinz; Mang, Uli; and Schwede, Wolfgang, 4,592,571, Cl. 280-756.000.

Mangiavacchi, Jacques, to Glaenzer Spicer. Tripod constant-speed joint, in particular for the transmission of a motor vehicle. 4,592,736, Cl. 464-111.000.

Mani, Krishnamurthy N.: *See—*
Chlanda, Frederick P.; and Mani, Krishnamurthy N., 4,592,817, Cl. 204-182.400.

Mannesmann Aktiengesellschaft: *See—*
Kaufmann, Robert; and Kring, Wilhelm, 4,592,409, Cl. 164-442.000.
Muller, Manfred; Nickel, Wilhelm; Schirmagg, Klaus-Peter; and Mailander, Engelbert, 4,592,222, Cl. 72-97.000.

Mannherz, Elmer D., to Fischer & Porter. Technique for stabilizing injection molded flowmeter liner. 4,592,886, Cl. 264-262.000.

Manning, David T.: *See—*
Wu, Tai-Teh; Huang, Jamin; and Manning, David T., 4,592,774, Cl. 71-90.000.

Marathon Oil Company: *See—*
Plummer, Mark A.; and Beazley, Phillip M., 4,592,905, Cl. 423-573.00R.

Marcellino, John G.: *See—*
Armstrong, Bruce G.; Principi, Fabio; and Marcellino, John G., 4,593,383, Cl. 365-203.000.

Marchant, D. D.; and Begej, Stefan, to Battelle Development Corporation. Information storage medium and method of recording and retrieving information thereon. 4,593,306, Cl. 357-45.000.

Marchetti, Augusto. Automatic taping unit with improved system of withdrawal of the tape applying rollers for carton sealing machines. 4,592,188, Cl. 53-137.000.

Marconi Avionics Limited: *See—*
Fitzpatrick, Roger S., 4,593,288, Cl. 343-705.000.

Mariani, Renato: *See—*
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., 4,592,721, Cl. 425-558.000.

Marier, Gregory J.; and Warnke, Wayne L., to Yamaha Hatsudoki Kabushiki Kaisha. Three-wheeled motor vehicle with pivotable frame. 4,592,441, Cl. 180-217.000.

Marketing Displays, Inc.: *See—*
Seely, James R., 4,592,158, Cl. 40-603.000.
Seely, James R.; and Hillstrom, David U., 4,592,530, Cl. 248-475.100.

Markovich, Voya: *See—*
Amelio, William J.; Jung, Dae Y.; Markovich, Voya; and Sambucetti, Carlos J., 4,593,016, Cl. 502-339.000.

Martin, George B.: *See—*
Pershing, David W.; Martin, George B.; and Munro, James M., 4,592,289, Cl. 110-345.000.

Martin, Gregory C.: *See—*
Fernandez, Emilio A.; Bezos, Angel P.; and Martin, Gregory C., 4,592,217, Cl. 73-129.000.

Martin, Herman R. Lockable gate latch. 4,592,578, Cl. 292-40.000.

Martin Paul, Inc.: *See—*
Belokin, Martin P., 4,592,486, Cl. 221-283.000.

Martin, Philip T., to ITT Corporation. Grounded tip detector. 4,593,156, Cl. 179-16.0AA.

Martinez, Miguel R.; Andrevski, Zygmunt M.; and Mitchell, William J., Jr., to RCA Corporation. System and method for the in press adjustment of workpiece holding force. 4,592,220, Cl. 72-16.000.

Martini, Phillip J. Apparatus for closing and sealing telescoping boxes. 4,592,189, Cl. 53-137.000.

Martz, Jonathan T.: *See—*
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,872, Cl. 558-281.000.
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,874, Cl. 558-283.000.

Maruhaski, Shigeaki: *See—*
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,592,965, Cl. 428-621.000.

Maryyanek, Richard D.; and Zdrok, Joseph Z., to American Optical Corporation. Respirator. 4,592,350, Cl. 128-206.170.

Masciale, John M.: *See—*
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,592,668, Cl. 400-127.000.

Masco Building Products Corp.: *See—*
Dustin, Terry C., 4,592,333, Cl. 126-21.00R.

Mason, Joseph C., Jr.: *See—*
Stanganelli, Dominick; Oddo, Guiseppe; and Sirchia, Antonino, 4,592,580, Cl. 293-136.000.

Mason, Murray R., to Canadian Fram Limited. Two speed accessory drive. 4,592,251, Cl. 74-785.000.

Mason, Stuart J.: *See—*
Harris, William G.; and Mason, Stuart J., 4,593,388, Cl. 370-67.000.

Masonite Corporation: *See—*
Lynch, Steven K.; Narhi, Erland D.; and Walter, Frank J., 4,592,185, Cl. 52-543.000.
Prior, William L.; and Sargeant, William C., 4,592,966, Cl. 428-689.000.

Massachusetts Institute of Technology: *See—*
Cohen, Robert E.; Corbin, George C.; and Baddour, Raymond F., 4,593,050, Cl. 522-2.000.

Massey-Ferguson Inc.: *See—*
Bubak, John, 4,592,455, Cl. 192-13.00R.

Mathews, Bruce D.; and Mims, James H., to Westinghouse Electric Corp. Method of operating an agile beam coherent radar. 4,593,286, Cl. 343-7.00A.

Matsuda, Fujio, to Mitsui Toatsu Chemicals, Incorporated. Process for the production of acrylamide and methacrylamide. 4,593,123, Cl. 564-127.000.

Matsuda, Hiroshi: *See—*
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, 4,592,980, Cl. 430-57.000.

Matsuda, Kazuya: *See—*
Kaneda, Naoya; and Matsuda, Kazuya, 4,592,638, Cl. 354-403.000.

Matsuda, Kiichi: *See—*
Kuroda, Hideo; Mukawa, Naoki; Matsuda, Kiichi; Honma, Toshihiro; and Fukuda, Hiroshi, 4,593,267, Cl. 340-347.0DD.

Matsuda, Toshio: *See—*
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Yamamoto, Munemitsu; and Hitotsuya, Ryoichi, 4,592,892, Cl. 422-28.000.

Matsufuji, Yohji; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Ink jet image recording device with pitch-shifted recording elements. 4,593,295, Cl. 346-140.00R.

Matsukawa, Hiroharu: *See—*
Ikeda, Kenji; Hayashi, Takayuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,593,298, Cl. 346-200.000.

Matsuki, Ikuo; Itai, Yasushi; and Nakamura, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Clutch device for working vehicles. 4,592,458, Cl. 192-83.000.

Matsumoto, Hiroshi: *See—*
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,593,094, Cl. 544-224.000.

Matsuo, Masashi; Miura, Yasushi; and Nakayoshi, Hideki, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Internal gear pump with branched intake plenum. 4,592,706, Cl. 418-171.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Koyanagi, Yukio, 4,593,414, Cl. 455-186.000.
Tanaka, Souhei; Mori, Kazuhiro; and Itemadani, Eiji, 4,592,137, Cl. 29-843.000.

Matsushita Electric Works, Ltd.: *See—*
Nakamura, Yoshimitsu; Takahashi, Kazuhisa; and Mishina, Kazuhiro, 4,593,269, Cl. 340-347.00P.
Sainomoto, Yoshinori; and Kitagawa, Fumio, 4,592,366, Cl. 128-680.000.

Matsushita Seiko Co., Ltd.: *See—*
Sugita, Kiyoshi; and Nakanishi, Hiroshi, 4,592,413, Cl. 165-59.000.

Matsutani, Kinya; and Sasaki, Katsutoki, to Kabushiki Kaisha Toshiba. Single crystal pulling system. 4,592,895, Cl. 422-106.000.

Matsuura, Shigeru: *See—*
Konishi, Akira; and Matsuura, Shigeru, 4,593,407, Cl. 382-46.000.

Matsuura, Syuuji, to Sharp Kabushiki Kaisha. Varactor tuned Colpitts oscillator with compensating varactor for wide band width. 4,593,255, Cl. 331-117.00R.

Matsuzaki, Kiyoto: *See—*
Yagami, Kouichi; and Matsuzaki, Kiyoto, 4,592,586, Cl. 296-218.000.

Matt, Peter, to Losinger AG. Anchoring of freely oscillating tension elements of steel of a dynamically stressed structural component. 4,592,181, Cl. 52-223.00L.

Mattar, Wade M.: *See—*
McHale, Edward J.; and Mattar, Wade M., 4,592,240, Cl. 73-861.220.

Mattei, Riccardo; and Dall'Osso, Gastone, to G. D. Societa per Azioni. Device for infeeding cigarettes to the wrapping line of a packer. 4,592,470, Cl. 209-535.000.

Mattiasson, Bo G., to Alfa-Laval AB. Method for the determination of biochemical data. 4,592,994, Cl. 435-7.000.
Mattison, Glenn D.; and Case, Michael A., to Air Preheater Company, Inc., The. Modular tubular heat exchanger. 4,592,416, Cl. 165-83.000.
Matwey, Paul: *See—*
Bruce, Clarence A.; Koh, Yoong G.; Matwey, Paul; Maiman, Mitchell H.; Chan, Wing C.; and DeFreest, Thomas J., 4,593,227, Cl. 313-482.000.
Maxwell, Stewart P.: *See—*
Plasencia, David B.; and Maxwell, Stewart P., 4,592,250, Cl. 74-688.000.
Mayer, Albin F. Ratchet wrench with multiple tools. 4,592,255, Cl. 81-63.000.
Mayer, Andreas, to BBC Brown, Boveri & Company, Limited. Pressure wave supercharger with an exhaust gas blow-down valve. 4,592,330, Cl. 123-559.000.
Mayer, Herbert E.: *See—*
Tabarelli, Werner; and Mayer, Herbert E., 4,592,648, Cl. 355-43.000.
Tabarelli, Werner; and Mayer, Herbert E., 4,592,650, Cl. 355-53.000.
Mayer, Norbert: *See—*
Hieber, Konrad; and Mayer, Norbert, 4,592,921, Cl. 427-9.000.
Mayer, Thomas: *See—*
Temple, Michael D.; Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., 4,592,939, Cl. 428-64.000.
Mayer, Wildman Industries, Inc.: *See—*
Tilson, Alan L.; Quay, Earl R.; and Knight, John C., 4,592,213, Cl. 66-9.00B.
Mayuzumi, Tominobu: *See—*
Naka, Akihiro; Mayuzumi, Tominobu; and Sugiyama, Hiroshi, 4,592,759, Cl. 44-51.000.
Mayzels, Leon: *See—*
Fish, Aaron M.; Dausseing, Jean-Paul; and Mayzels, Leon, 4,592,453, Cl. 192-0.02R.
Mazda Motor Corporation: *See—*
Hitomi, Mitsuo; Sasaki, Junzo; and Ueda, Kazuhiko, 4,592,310, Cl. 123-52.00M.
McCabe, David J.; and Sumerling, Geoffrey W., to Plessey Overseas Limited. Flip-flop phase detector circuit for phase locked loop. 4,593,253, Cl. 331-1.00A.
McCaffrey, Patrick M.: *See—*
Anderson, Nathaniel C.; Daby, Larry E.; Johnson, Gene A.; and McCaffrey, Patrick M., 4,593,334, Cl. 360-126.000.
McConnell, Sylvia J. Shampoo lift for a wheelchair. 4,592,695, Cl. 414-678.000.
McCord Heat Transfer Corporation: *See—*
Beasley, Marvin D., 4,592,414, Cl. 165-76.000.
McCormick & Company, Incorporated: *See—*
Rowell, Lorne A., 4,592,272, Cl. 99-353.000.
McCurry, Troy L.: *See—*
Tolbert, Richard K.; and McCurry, Troy L., 4,592,144, Cl. 30-394.000.
McDaniel, Max P.: *See—*
Johnson, Marvin M.; Nowack, Gerhard P.; and McDaniel, Max P., 4,593,146, Cl. 585-667.000.
McDonie, Arthur F.; and Kaiser, Donald B., to RCA Corporation. Shield cup to cage assembly connecting tab member for photomultiplier tube. 4,593,229, Cl. 313-533.000.
McDonnell Douglas Corporation: *See—*
Albert, Donn E., 4,592,717, Cl. 425-400.000.
Lindner, Walter E.; and Coggins, Dolphus L., 4,592,854, Cl. 252-79.300.
McEdwards, Timothy K. Flame simulating apparatus. 4,593,232, Cl. 315-199.000.
McEntee, Thomas C.: *See—*
Guilbault, Lawrence J.; and McEntee, Thomas C., 4,592,843, Cl. 210-692.000.
McEntire, Edward E.: *See—*
Darden, Jerome W.; and McEntire, Edward E., 4,592,853, Cl. 252-75.000.
McGeer, James P., to Alcan International Limited. Electrolytic reduction cells for aluminium production. 4,592,820, Cl. 204-243.00R.
McGrane, Kathleen M.: *See—*
Smith, Thomas W.; Teegarden, David M.; McGrane, Kathleen M.; and Luca, David J., 4,592,989, Cl. 430-110.000.
McGuire, Edward L., III. Scan controller for ion implanter device. 4,593,200, Cl. 250-492.200.
McHale, Edward J.; and Mattar, Wade M., to Foxboro Company, The. Electrical-charge sensing flowmeter. 4,592,240, Cl. 73-861.220.
McKenney, John D., to Lear Siegler, Inc. Portable traffic control apparatus. 4,593,265, Cl. 340-114.00B.
McKibben, Gary E.: *See—*
Drobish, James L.; and McKibben, Gary E., 4,593,408, Cl. 383-43.000.
McKoy, Thermon E.: *See—*
Hovel, Harold J.; and McKoy, Thermon E., 4,592,793, Cl. 148-189.000.
McLintock, Gavin A.: *See—*
Slattery, Peter F.; Foster, William R.; McLintock, Gavin A.; and Fraser, James K., 4,593,192, Cl. 250-229.000.
McMichael, Dannie L., to Coca-Cola Company, The. Beverage dispenser system convertable between gravity and pressure. 4,592,490, Cl. 222-129.100.
McMillen, James M., to Mobil Oil Corporation. Method for removing water from produced crude oil. 4,592,849, Cl. 210-799.000.
McMurray, William, to General Electric Company. Driver circuits for gate turn-off thyristors and bipolar transistors. 4,593,204, Cl. 307-252.00C.
McNamara, George E., to Sico Incorporated. Bed frame construction. 4,592,105, Cl. 5-238.000.
McNinch, Edwin K., Jr.; and McNinch, James E. Modular block retaining wall. 4,592,678, Cl. 405-284.000.
McNinch, James E.: *See—*
McNinch, Edwin K., Jr.; and McNinch, James E., 4,592,678, Cl. 405-284.000.
McRight, Tulon C., Jr.; Friday, William A.; and Mitchell, Ronald W., to United States of America, Army. Synchronizer circuit for synchronizing the scan of a device with an externally received triggering signal. 4,593,207, Cl. 307-271.000.
McWhirter, John G.; Pike, Edward R.; and Watson, David J., to Secretary of State. Digital signal processor. 4,593,378, Cl. 364-900.000.
MDT Biologic Company: *See—*
Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, Keith, 4,592,896, Cl. 422-109.000.
Mead, Barry B.; and Piosenka, Gerald V., to Motorola, Inc. Quasi parallel cyclic redundancy checker. 4,593,393, Cl. 371-37.000.
Mead Corporation, The: *See—*
Kannapell, Henry N.; and Bobick, Thomas W., 4,593,325, Cl. 358-282.000.
Nelson, Erik K.; O'Connor, Joseph G.; Boyer, David A.; and Saccocio, Edward J., 4,592,986, Cl. 430-98.000.
Meals Incorporated: *See—*
Anderson, C. Keith; Vieth, George C., Jr.; Vance, Lane D.; and Grant, Darwin D., 4,592,485, Cl. 221-150.0HC.
Mebane Packaging Corporation: *See—*
Wilson, Donnie S., 4,592,163, Cl. 43-122.000.
Mecke, Norbert; Krauter, Heinrich; and Kuchenreuther, Wieland, to Pelikan Aktiengesellschaft. Thermocolor ribbon. 4,592,945, Cl. 428-195.000.
Medical College of Wisconsin, Inc., The: *See—*
Hyde, James S.; Froncisz, Wojciech; and Lai, Ching-San, 4,593,248, Cl. 324-317.000.
Medtronic, Inc.: *See—*
Clifford, Mark J.; Hock, Robert H.; Jagunich, Douglas M.; and Robinson, Paul J., 4,593,284, Cl. 340-870.180.
Jevne, Allan H.; Vegoe, Brett R.; Holmblad, Carolann M.; and Cahalan, Patrick T., 4,593,053, Cl. 523-111.000.
Mefina S.A.: *See—*
Fresard, Marcel, 4,592,296, Cl. 112-83.000.
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., to Polaroid Corporation. 1-phenyl-5-mercapto tetrazoles. 4,593,108, Cl. 548-251.000.
Meichsner, Walter: *See—*
Rellermeyer, Heinrich; Meichsner, Walter; and Gmohling, Werner, 4,592,777, Cl. 75-58.000.
Meier, Thomas R.: *See—*
Paulsen, Craig A.; and Meier, Thomas R., 4,592,377, Cl. 133-5.00R.
Meistrick, Zdenek S., to Jacobs Manufacturing Company, The. Engine retarding method and apparatus. 4,592,319, Cl. 123-321.000.
Melvin-AHD: *See—*
Schihl, Raymond J., 4,592,531, Cl. 248-646.000.
Melvin, Lawrence S., Jr.: *See—*
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,593,131, Cl. 568-632.000.
Mentor Corporation: *See—*
Kuzmak, Lubomyr I.; and Coe, Frederick L., 4,592,339, Cl. 128-1.00R.
Merck & Co., Inc.: *See—*
Baldwin, John J.; Varga, Sandor L.; and Ponticello, Gerald S., 4,593,039, Cl. 514-362.000.
Colegrove, George T.; and Lindroth, Thomas A., 4,592,760, Cl. 44-51.000.
Hartman, George D.; Halczenko, Wasyl; and Young, Steven D., 4,593,033, Cl. 514-290.000.
Merckle GmbH: *See—*
Metz, Gunter, 4,593,044, Cl. 514-557.000.
Mercurio, Leonard, to Set-O-Matic, Inc. Timer for coin operated devices. 4,592,659, Cl. 368-1.000.
Merle, Julius. Wheel brake cooling apparatus for aircraft. 4,592,452, Cl. 188-264.0AA.
Merrell Dow Pharmaceuticals Inc.: *See—*
Wright, Terry L., 4,593,099, Cl. 546-114.000.
Merriman, Jeffrey E.: *See—*
Metzger, Donald D.; and Merriman, Jeffrey E., 4,592,846, Cl. 210-747.000.
Mertens, Heinrich: *See—*
Fikentscher, Rolf; Mertens, Heinrich; and Reincke, Klaus, 4,592,757, Cl. 8-567.000.
Fikentscher, Rolf; Mertens, Heinrich; Reincke, Klaus; and Vescia, Michele, 4,592,758, Cl. 8-567.000.
Mesch, Keith A.; and Conroy, Gary M., to Morton Thiokol, Inc. Stabilizers for halogen-containing organic polymers comprising an organotin mercaptide and a dialkyl ester of an unsaturated dicarboxylic acid. 4,593,059, Cl. 524-181.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Hahn, Michael; Friedberger, Otmar; and Singer, Gerhard, 4,592,701, Cl. 416-134.00A.
Metabowerke GmbH & Company: *See—*
Schnizler, Albrecht, 4,592,142, Cl. 30-210.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Franz, Volker; and Geissen, Rolf, 4,592,412, Cl. 165-2.000.
Metiver, Richard. Foot strap and baseplate assembly. 4,592,734, Cl. 441-74.000.
Metz, Gunter, to Merckle GmbH. Injectable solution for the treatment of inflammations. 4,593,044, Cl. 514-557.000.
Metzger, Donald D.; and Merriman, Jeffrey E., to PPG Industries, Inc. Method and reservoir for in-ground containment of liquid waste. 4,592,846, Cl. 210-747.000.
Meunier, Georges, to Tunzini-Nessi Entreprises d'Equipments. Packing elements for device for countercurrent exchange, particularly heat exchange, between solid particles and a gas current. 4,592,151, Cl. 34-168.000.
Meyer, Helmut P., to Allied Corporation. Igniter with improved insulator support. 4,593,340, Cl. 361-253.000.
Meyerson, Bernard S.; Plecenik, Richard M.; and Scott, Bruce A., to International Business Machines Corporation. High efficiency homogeneous chemical vapor deposition. 4,592,933, Cl. 427-255.100.
MG Industries: *See—*
Brodbeck, Howard D.; and Krongold, Martin A., 4,592,205, Cl. 62-49.000.
Michaelis, Theodore D., to RCA Corporation. Apparatus and method for generating calibrated optical encoder pulses. 4,593,193, Cl. 250-231.0SE.
Michel, Robert, to Renault Vehicules Industriels. Hydropneumatic system for recovering braking energy for urban vehicles. 4,592,454, Cl. 192-3.230.
Michigan Technological University, Board of Control of: *See—*
Yang, David C., 4,592,834, Cl. 209-166.000.
Micro Consultants Limited: *See—*
Kellar, Paul R. N.; and Long, Robert J., 4,593,316, Cl. 358-140.000.
Microlife Technics, Inc.: *See—*
Vandenbergh, Peter A., 4,593,003, Cl. 435-172.300.
Middleton, Michael C.: *See—*
Chase, Mark T.; and Middleton, Michael C., 4,593,349, Cl. 364-200.000.
Mikami, Naoko: *See—*
Higuchi, Ryoichi; Honma, Masao; Sakurai, Takao; and Mikami, Naoko, 4,592,858, Cl. 252-299.660.
Millar, Douglas J., to Northern Telecom Limited. Adaptive differential PCM system with residual-driven adaptation of feedback predictor. 4,593,398, Cl. 375-27.000.
Miller, Harry; and Zweifel, Terry L., to Sperry Corporation. Windshear detection and warning system with evasion command. 4,593,285, Cl. 340-968.000.
Miller, Jerry A., to Motorola, Inc. Transceiver protection arrangement. 4,593,409, Cl. 455-73.000.
Miller, Kenneth A.: *See—*
Fridge, D. Alan; and Miller, Kenneth A., 4,593,368, Cl. 364-525.000.
Miller, Randolph F.: *See—*
Smith, David B.; Miller, Randolph F.; and Moore, Jo.n M., 4,592,544, Cl. 272-73.000.
Mims, James H.: *See—*
Mathews, Bruce D.; and Mims, James H., 4,593,286, Cl. 343-7.00A.
Minnesota Mining and Manufacturing Company: *See—*
Lee, John J.; Avila, Arthur F.; Danby, Hal C.; an.. deigler, Myron A., 4,592,370, Cl. 128-746.000.
Minnesota Rubber Company: *See—*
Boyd, Richard M., 4,592,390, Cl. 138-45.000.
Minolta Camera Kabushiki Kaisha: *See—*
Imaizumi, Masaru; and Tanaka, Kenzou, 4,592,642, Cl. 355-3.0DD.
Mirowski, Mieczyslaw: *See—*
Imran, Mir, 4,592,367, Cl. 128-706.000.
Mishina, Kazuhiro: *See—*
Nakamura, Yoshimitsu; Takahashi, Kazuhisa; and Mishina, Kazuhiro, 4,593,269, Cl. 340-347.00P.
Misumi, Teruo: *See—*
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,592,985, Cl. 430-84.000.
Mita Industrial Co., Ltd.: *See—*
Higashiguchi, Teruaki; Miyakawa, Nobuhiro; Yano, Koji; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,592,643, Cl. 355-3.00R.
Mitchell, Renzo D.; Thomas, Don N.; and Smith, Richard J., to RCA Corporation. Distributed processor with periodic data transfer from each memory to like addresses of all other memories. 4,593,350, Cl. 364-200.000.
Mitchell, Ronald W.: *See—*
McRight, Tulon C., Jr.; Friday, William A.; and Mitchell, Ronald W., 4,593,207, Cl. 307-271.000.
Mitchell, Wayne A.: *See—*
Hsieh, Shane; and Mitchell, Wayne A., 4,592,992, Cl. 430-309.000.
Mitchell, William J., Jr.: *See—*
Martinez, Miguel R.; Andrevski, Zygmunt M.; and Mitchell, William J., Jr., 4,592,220, Cl. 72-16.000.
Mitsubishi Chemical Industries Limited: *See—*
Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,593,122, Cl. 562-414.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujishima, Kazuyasu; Shimotori, Kazuhiro; Ozaki, Hideyuki; and Nakano, Takao, 4,593,382, Cl. 365-149.000.
Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,592,703, Cl. 417-366.000.
Takeda, Koji; Sugimoto, Takeshi; and Yamada, Yusuke, 4,593,338, Cl. 361-18.000.
Ueda, Sei; Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Asami, Kazutomo; and Wada, Fumio, 4,592,705, Cl. 418-63.000.
Yamazaki, Kisuke; Otsubo, Michio; and Okuma, Keiko, 4,592,206, Cl. 62-160.000.
Yoshida, Tadashi, 4,592,504, Cl. 237-19.000.
Mitsuhashi, Yasuo; Takenouchi, Masanori; Okado, Kenji; Imai, Eiichi; and Suematsu, Koshi, to Canon Kabushiki Kaisha. Toner application method and developer composition. 4,592,987, Cl. 430-102.000.
Mitsui & Co., Ltd.: *See—*
Miyaji, Kiyoshi; Moriyama, Katutoshi; and Oka, Yoshifumi, 4,592,261, Cl. 83-102.100.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Matsuda, Fujio, 4,593,123, Cl. 564-127.000.
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.
Mitsuka, Ikuo, to Dainippon Screen Seizo Kabushiki Kaisha. High-speed processing method of line segment coordinates. 4,593,377, Cl. 364-900.000.
Mitsuoka, Katsuya: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.
Mitzner, Horst, to Rheinische Maschinenfabrik & Eisengiesserei Anton Roper GmbH & Co. Kommanditgesellschaft. Arrangement for the automatic filling of a container. 4,592,397, Cl. 141-18.000.
Miura, Yasushi: *See—*
Matsuo, Masashi; Miura, Yasushi; and Nakayoshi, Hideki, 4,592,706, Cl. 418-171.000.
Mixalloy Limited: *See—*
Davies, Idwal; and Fage, John L., 4,592,780, Cl. 75-229.000.
Miyaji, Kiyoshi; Moriyama, Katutoshi; and Oka, Yoshifumi, to Central Glass Company, Limited; Toray Engineering Co., Ltd.; and Mitsui & Co., Ltd. Cutting device for extra fringe of laminated glass interlayer. 4,592,261, Cl. 83-102.100.
Miyakawa, Nobuhiro: *See—*
Higashiguchi, Teruaki; Miyakawa, Nobuhiro; Yano, Koji; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,592,643, Cl. 355-3.00R.
Miyake, Akio; and Yamaoka, Masayoshi, to Takeda Chemical Industries, Ltd. Method for producing 1-iodoalkyl acylates. 4,593,115, Cl. 560-1.000.
Miyasaka, Eiji: *See—*
Henmi, Kojiro; and Miyasaka, Eiji, 4,592,652, Cl. 355-76.000.
Miyata, Teruo; and Taira, Toshio, to Koken Co., Ltd. Aqueous atelocollagen solution and method of preparing same. 4,592,864, Cl. 530-356.000.
Miyatake, Kimio; and Aoki, Junji, to Horiba, Ltd. Gas analyzer. 4,593,[illegible] Cl. 250-343.000.
Miyazaki, Kenji: *See—*
Sato, Kenichi; Takano, Satoshi; and Miyazaki, Kenji, 4,592,935, Cl. 428-659.000.
Miyoshi, Noriomi: *See—*
Kawasaki, Tetsuji; Miyoshi, Noriomi; and Tachibana, Yukimasa, 4,593,190, Cl. 250-223.00R.
Miyoshi, Takahito; Okutu, Toshimitu; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,592,952, Cl. 428-323.000.
Mizelle, Ned W. Mechanism for a sofa sleeper. 4,592,102, Cl. 5-13.000.
Mizui, Takashi: *See—*
Kamagata, Kazuo; Yamada, Toshiaki; Kawata, Shunichi; and Mizui, Takashi, 4,593,069, Cl. 525-113.000.
Mizuno, Toshiya; Teramoto, Yoshikichi; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride resin split yarn, process for production thereof and filter comprising the same. 4,592,949, Cl. 428-224.000.
Mizushima, Yoshihiro; and Shimizu, Kazuyuki, to Fujitsu Limited. Machine check processing system. 4,593,391, Cl. 371-15.000.
Mo och Domsjo AB: *See—*
Holmstrom, Sten, 4,592,115, Cl. 19-82.000.
Noreus, Sture; Lundberg, Hans; Uhlin, Lars; and Lindquist, Bengt, 4,592,804, Cl. 162-19.000.
Moatti, Jean-Claude: *See—*
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Mobil Oil Corporation: *See—*
Benoit, Gordon L., 4,592,938, Cl. 428-35.000.
Chu, Chin-Chiun, 4,593,134, Cl. 585-445.000.
Chu, Yung F.; and Shih, Stuart S., 4,592,828, Cl. 208-89.000.
Kaeding, Warren W.; and Lee, Carol S., 4,593,136, Cl. 585-446.000.
McMillen, James M., 4,592,849, Cl. 210-799.000.
Nowlin, Thomas E., 4,593,009, Cl. 502-107.000.
Valyocsik, Ernest W., 4,592,902, Cl. 423-328.000.
Modine Manufacturing Company: *See—*
Hughes, Gregory G., 4,592,420, Cl. 165-151.000.
Moen, Bruce A.: *See—*
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.
Moffatt, E. Marston; and Swarts, Richard E., to United Technologies Corporation. Angular velocity sensor. 4,592,232, Cl. 73-505.000.
Mojden, Wallace W.; and Darr, Robert E., to Fleetwood Systems, Inc. Carousel type feeder for carton blanks. 4,592,462, Cl. 198-464.200.

Monroe, James R.: *See—*
Kubacki, Edward F.; Jacobs, Edward C.; Masciale, John M.; and Monroe, James R., 4,592,668, Cl. 400-127.000.

Monsanto Company: *See—*
Blyth, Randolph C.; and Ucci, Pompelio A., 4,592,940, Cl. 428-96.000.
Chupp, John P.; and Neumann, Thomas E., 4,593,144, Cl. 568-936.000.

Monte, Anthony J. Fire extinguisher support mechanism incorporating an audible alarm. 4,592,301, Cl. 116-67.00R.

Moon, Malcolm W., to Upjohn Company, The. Piperazinone and piperazine polypeptides. 4,593,098, Cl. 544-373.000.

Mooney, Joseph R. Tank overfill protection means. 4,592,386, Cl. 137-588.000.

Moore, John M.: *See—*
Smith, David B.; Miller, Randolph F.; and Moore, John M., 4,592,544, Cl. 272-73.000.

Moos, Walter: *See—*
Bristol, James A.; Moos, Walter; and Trivedi, Bharat K., 4,593,019, Cl. 514-46.000.

Morales, Alfredo: *See—*
Galiasso, Roberto; Salazar, Jose A.; Morales, Alfredo; and Carrasquel, Angel R., 4,592,827, Cl. 208-59.000.

Morbitzer, Hans P.: *See—*
Novak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,592,569, Cl. 280-624.000.

Morgan, Arvid E., to Hughes Tool Company. Through tubing progressing cavity pump. 4,592,427, Cl. 166-369.000.

Morgan, Colin G.: *See—*
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Mori, Fumio: *See—*
Tsuji, Masao; Mori, Fumio; and Ichihara, Yoshihiro, 4,592,868, Cl. 260-397.100.

Mori, Kazuhiro: *See—*
Tanaka, Souhei; Mori, Kazuhiro; and Itemadani, Eiji, 4,592,137, Cl. 29-843.000.

Mori, Yasuharu: *See—*
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Morijiri, Makoto: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.

Morimoto, Makoto: *See—*
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, 4,593,097, Cl. 544-347.000.

Morimoto, Masafumi: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,593,356, Cl. 364-419.000.

Morinaga, Hisao: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,593,356, Cl. 364-419.000.

Morita, Kenji: *See—*
Hashimoto, Akira; Saito, Susumu; Arimoto, Akira; and Morita, Kenji, 4,592,622, Cl. 350-395.000.

Moriya, Yasuo: *See—*
Nakayama, Masaharu; Fukushi, Kyosuke; Moriya, Yasuo; and Suzuki, Nobuyoshi, 4,593,067, Cl. 525-92.000.

Moriyama, Katutoshi: *See—*
Miyaji, Kiyoshi; Moriyama, Katutoshi; and Oka, Yoshifumi, 4,592,261, Cl. 83-102.100.

Moroi, Shiro: *See—*
Kita, Yasushi; Nakano, Hishaji; Moroi, Shiro; and Sakanoue, Akira, 4,593,132, Cl. 570-150.000.

Morris, Kenneth G.: *See—*
Stadtmiller, William H.; and Morris, Kenneth G., 4,592,851, Cl. 252-32.70E.

Morris, Wayne. Oil pan drain receptacle. 4,592,448, Cl. 184-1.500.

Morse, Albert I.: *See—*
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert I., 4,592,798, Cl. 156-578.000.

Morton Thiokol, Inc.: *See—*
Guilbault, Lawrence J.; and McEntee, Thomas C., 4,592,843, Cl. 210-692.000.
Mesch, Keith A.; and Conroy, Gary M., 4,593,059, Cl. 524-181.000.

Mortreux, Andre ; Petit, Francis; Denis, Philippe; Buono, Gerard; and Peiffer, Gilbert, to Societe Chimique des Charbonnages S.A. Process for dimerizing conjugated dienes. 4,593,140, Cl. 585-508.000.

Morwen s.r.l.: *See—*
Giacomelli, Renato, 4,592,629, Cl. 351-41.000.

Moscatelli, Romano: *See—*
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Mosheim, C. Edward: *See—*
Bielecki, Edwin J.; Mosheim, C. Edward; and Sheth, Umedray L., 4,592,904, Cl. 423-472.000.

Moss, Hans. Blowing nozzle for silent outflow of gas. 4,592,509, Cl. 239-424.000.

Mosser, Mark F.; and Simmons, Alfred E., Jr., to Sermatech. Coated part, coating therefor and method of forming same. 4,592,958, Cl. 428-432.000.

Motorola, Inc.: *See—*
Bass, Alan S.; and Lee, Shi-Chuan, 4,593,205, Cl. 307-269.000.
Bickley, Robert H., 4,593,256, Cl. 331-117.00R.
Davis, Earl K.; Drye, James E.; and Reed, David J., 4,592,794, Cl. 156-89.000.
Hawkins, George C., 4,593,155, Cl. 179-2.0EA.
Legge, Ronald N., 4,592,129, Cl. 29-572.000.
Mead, Barry B.; and Piosenka, Gerald V., 4,593,393, Cl. 371-37.000.
Miller, Jerry A., 4,593,409, Cl. 455-73.000.
Neidorff, Robert A.; and Main, W. Eric, 4,593,206, Cl. 307-270.000.
Parker, Norman W., 4,593,402, Cl. 381-16.000.
Svager, Yehuda, 4,593,212, Cl. 307-475.000.

Motortech, Inc.: *See—*
Yunick, Henry, 4,592,329, Cl. 123-545.000.

Motoyama, Shimesu; Sakashita, Shizuka; Myo, Nagayoshi; Yasumi, Hirotsune; and Ogishima, Hiroaki, to Freund Industrial Co., Ltd. Coating method and apparatus. 4,592,302, Cl. 118-303.000.

Mouser, Charles L.: *See—*
Haley, John E., Jr.; Lynch, Michael J.; and Mouser, Charles L., 4,593,365, Cl. 364-510.000.

Mouyen, Francis. Apparatus for providing a dental radiological image and intra-oral sensor used therewith. 4,593,400, Cl. 378-99.000.

Mudra, Robert E., to Zenith Electronics Corporation. Breakaway jumper edge connector. 4,592,606, Cl. 339-31.00R.

Muhle, Manfred. Device for manufacturing thermo-insulated compound profiles for windows, doors and facades. 4,592,123, Cl. 29-243.500.

Mukaidani, Toyoyuki: *See—*
Ishida, Keizo; Ohshima, Yoshikuni; Mukaidani, Toyoyuki; Okouchi, Isao; and Izumi, Kenkichi, 4,592,419, Cl. 165-112.000.

Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, to Alps Electric Co., Ltd. Thin-film magnetic head and composite material substrate therefor. 4,592,963, Cl. 428-544.000.

Mukawa, Naoki: *See—*
Kuroda, Hideo; Mukawa, Naoki; Matsuda, Kiichi; Honma, Toshihiro; and Fukuda, Hiroshi, 4,593,267, Cl. 340-347.0DD.

Muller, Hanns P.: *See—*
Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., 4,592,957, Cl. 428-402.210.

Muller, Manfred; Nickel, Wilhelm; Schirmagg, Klaus-Peter; and Mailander, Engelbert, to Mannesmann Aktiengesellschaft. Device for the delivery and removal of the mandrel rods in skew and longitudinal rolling mills. 4,592,222, Cl. 72-97.000.

Muller, Rainer: *See—*
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.

Muller-Spath, Gerhard: *See—*
Boiting, Hans H.; Federhen, Bernd; and Muller-Spath, Gerhard, 4,592,679, Cl. 406-127.000.

Mulligan, James H., Jr.: *See—*
Lucas, Charles H.; and Mulligan, James H., Jr., 4,593,250, Cl. 330-107.000.

Multi-Elmac Company: *See—*
Jacob, Keith, 4,593,412, Cl. 455-129.000.

Munksgaard, Erik C.: *See—*
Asmussen, Erik; and Munksgaard, Erik C., 4,593,054, Cl. 523-118.000.

Munro, James M.: *See—*
Pershing, David W.; Martin, George B.; and Munro, James M., 4,592,289, Cl. 110-345.000.

Munson, Harry R., Jr.; and Boswell, Robert F., Jr., to A. H. Robins Company, Inc. 2-alkoxy-N-(1-azabicyclo[2.2.2]oct-3-yl)benzamides and thiobenzamides. 4,593,034, Cl. 514-305.000.

Murakami, Kunio, to Unitika Ltd. Process for producing a piezo- and pyro-electric film. 4,592,880, Cl. 264-22.000.

Murakami, Terukiyo; Tamura, Minoru; and Inoue, Hideaki, to Nissan Motor Company, Limited. Apparatus for throttle valve control. 4,592,322, Cl. 123-361.000.

Murase, Katsuo: *See—*
Kanda, Hajime; Murase, Katsuo; Hishida, Hiroshi; Adachi, Eiichi; Wada, Yoshinori; and Koseki, Yuji, 4,593,323, Cl. 358-256.000.

Murata Manufacturing Co., Ltd.: *See—*
Nakamura, Takeshi, 4,593,160, Cl. 179-110.00A.

Murayama, Naohiro: *See—*
Mizuno, Toshiya; Teramoto, Yoshikichi; and Murayama, Naohiro, 4,592,949, Cl. 428-224.000.

Murayama, Noboru: *See—*
Suzuki, Koichi; and Murayama, Noboru, 4,593,297, Cl. 346-160.000.

Murphy, John R.: *See—*
Hinney, Harry R.; and Murphy, John R., 4,593,128, Cl. 568-701.000.

Murray Corporation: *See—*
Proctor, Robert H.; and Anjos, Theodore R., 4,592,576, Cl. 285-253.000.

Murtfeldt, Robert L., to Baxter Travenol Laboratories, Inc. Method for the production of an antimicrobial catheter. 4,592,920, Cl. 427-2.000.

Musselmann, Walter; Bahr, Theodor; and Thumm, Helmut, to J. M. Voith, GmbH. Pulper device. 4,592,513, Cl. 241-46.170.

Mustonen, Antero, to Oy Wartsila AB. Dredger with transport basin having loading and unloading mechanism. 4,592,155, Cl. 37-54.000.

Mutschler, Gunter, to Neuweg Fertigung GmbH. Continually adjustable ball-type planetary gear set. 4,592,247, Cl. 74-198.000.

Myers, Earl C., Jr., to AMP Incorporated. Gender change connector. 4,592,614, Cl. 339-154.00A.

Myo, Nagayoshi: *See—*
Motoyama, Shimesu; Sakashita, Shizuka; Myo, Nagayoshi; Yasumi, Hirotsune; and Ogishima, Hiroaki, 4,592,302, Cl. 118-303.000.

Myrick, John S.: *See—*
Smith, Hudson C.; Atwood, Wesley W.; Myrick, John S.; and Sweat, Samuel F., 4,592,901, Cl. 423-320.000.

Nabisco Brands, Inc.: *See—*
Horwath, Robert O., 4,593,001, Cl. 435-94.000.

Nabulsi, Hazem; and Kline, Donald D., to Panavision, Inc. Apparatus and method for eliminating video shading ears. 4,593,235, Cl. 315-381.000.

Nagahama, Yasuhide: *See—*
Tuda, Goro; Kada, Hironosuke; Sekino, Teruyoshi; and Nagahama, Yasuhide, 4,592,697, Cl. 414-719.000.

Nagahira, Jyoji: *See—*
Suzuki, Koji; Nagahira, Jyoji; and Kuroda, Kouki, 4,592,646, Cl. 355-14.00R.

Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. 2-[[[4-halo-2-fluoro-5(alkyl or alkenyloxy)phenyl]amino]-carbonyl or thiocarbonyl]-3,4,5,6-tetrahydro-1(2H)-pyridazinecarboxylic acid compounds and lower alkyl esters thereof. 4,593,094, Cl. 544-224.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Chain gear for a bicycle. 4,592,738, Cl. 474-80.000.

Naganuma, Tsutomu; Hirayama, Sigeru; Kumagai, Hiroji; Sawada, Manabu; Tanaka, Tsuneo; and Kumano, Isao, to Toppan Printing Co., Ltd.; and Toyo Ink Mfg. Co., Ltd. Lithographic printing plate. 4,592,977, Cl. 430-18.000.

Nagao, Yasuhiro: *See—*
Katoh, Kazunori; and Nagao, Yasuhiro, 4,592,243, Cl. 74-7.00E.

Nagaoka, Yoshimichi: *See—*
Hirota, Akira; and Nagaoka, Yoshimichi, 4,593,327, Cl. 358-330.000.

Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Endoscope. 4,593,313, Cl. 358-98.000.

Nagata, Takuji; and Itou, Isao, to Toyoda Gosei Co., Ltd. Arcuate side molding. 4,592,937, Cl. 428-31.000.

Nagata, Tomizou; Sakakibara, Kouzou; and Sakano, Makoto, to Japan Tobacco & Salt Public Corporation, The. Device for reciprocally driving a shaft. 4,592,244, Cl. 74-57.000.

Nagata, Wataru: *See—*
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.

Nagel, Erich: *See—*
Freitag, Friedbert; Hujer, Friedrich; Nagel, Erich; Payrhammer, Bernd; and Zahn, Wolfgang, 4,592,649, Cl. 355-43.000.

Nagennast, Crosby O., to Special Devices, Inc. Arming and firing device. 4,592,281, Cl. 102-254.000.

Nago, Kumio: *See—*
Kadono, Masaru; Nago, Kumio; Tsuchimoto, Shuuhei; and Yoshikawa, Mitsuhiko, 4,592,923, Cl. 427-35.000.

Naiki, Kazuaki, to NEC Corporation. Color cathode ray tube having electron gun with reduced eddy current loss at shield cup. 4,593,226, Cl. 313-413.000.

Nair, Ravindra K.: *See—*
Hong, Se J.; Nair, Ravindra K.; and Shapiro, Eugene, 4,593,351, Cl. 364-200.000.

Naka, Akihiro; Mayuzumi, Tominobu; and Sugiyama, Hiroshi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Production of aqueous coal slurries having high coal contents. 4,592,759, Cl. 44-51.000.

Nakagawa, Kazuyuki: *See—*
Tominaga, Michiaki; Ogawa, Hidenori; Fujioka, Takafumi; Yang, Yung-hsiung; and Nakagawa, Kazuyuki, 4,593,035, Cl. 514-312.000.

Nakagawa, Toyoaki, to Nissan Motor Co., Ltd. Air/fuel ratio control system. 4,592,325, Cl. 123-489.000.

Nakajima, Kazuo; and Tanahashi, Toshiyuki, to Fujitsu Limited. Liquid phase epitaxial growth method for producing a III-V group compound semiconductor. 4,592,791, Cl. 148-171.000.

Nakamura, Hideo: *See—*
Fujii, Tetsuya; Harada, Nobuo; Takeuchi, Shuji; Kato, Yoshiei; Nakamura, Hideo; Sakuraya, Toshikazu; and Habu, Yasuhiro, 4,592,778, Cl. 75-59.220.

Nakamura, Hiroaki, to Olympus Optical Co., Ltd. Electronic flash units. 4,592,639, Cl. 354-416.000.

Nakamura, Kenji: *See—*
Matsuki, Ikuo; Itai, Yasushi; and Nakamura, Kenji, 4,592,458, Cl. 192-83.000.

Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, to Victor Company of Japan, Ltd.; and Tokuyama Sekisui Industry, Corporation Limited. Conductive resin composition and information record. 4,592,862, Cl. 252-511.000.

Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Piezoelectric speaker. 4,593,160, Cl. 179-110.00A.

Nakamura, Toshiyuki: *See—*
Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,592,703, Cl. 417-366.000.

Nakamura, Yoshimitsu; Takahashi, Kazuhisa; and Mishina, Kazuhiro, to Matsushita Electric Works, Ltd. Compact optional rotary encoder having adjustable light admitting and receiving components. 4,593,269, Cl. 340-347.00P.

Nakane, Toshiaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera-equipped ophthalmoscope. 4,592,631, Cl. 351-206.000.

Nakanishi, Hiroshi: *See—*
Sugita, Kiyoshi; and Nakanishi, Hiroshi, 4,592,413, Cl. 165-59.000.

Nakanishi, Tosaku: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,593,356, Cl. 364-419.000.

Nakano, Hiroshi: *See—*
Shiratsuchi, Kouji; and Nakano, Hiroshi, 4,592,316, Cl. 123-195.00C.

Nakano, Hishaji: *See—*
Kita, Yasushi; Nakano, Hishaji; Moroi, Shiro; and Sakanoue, Akira, 4,593,132, Cl. 570-150.000.

Nakano, Kazumi; Takakuwa, Eiji; and Utsumi, Hiroo, to Nippondenso Co., Ltd. Ignition control system for internal combustion engines. 4,592,324, Cl. 123-424.000.

Nakano, Takao: *See—*
Fujishima, Kazuyasu; Shimotori, Kazuhiro; Ozaki, Hideyuki; and Nakano, Takao, 4,593,382, Cl. 365-149.000.

Nakao, Etsuro, to Japan Vilene Co., Ltd. Method of manufacturing an electret filter. 4,592,815, Cl. 204-165.000.

Nakashima, Keishi: *See—*
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,592,963, Cl. 428-544.000.

Nakayama, Masaharu; Fukushi, Kyosuke; Moriya, Yasuo; and Suzuki, Nobuyoshi, to Nippon Oil and Fats Co. Low shrinkable unsaturated polyester resin composition. 4,593,067, Cl. 525-92.000.

Nakayama, Tadashi: *See—*
Kawamo, Yakichiro; Suga, Yozo; Nozawa, Tadao; and Nakayama, Tadashi, 4,592,789, Cl. 148-111.000.

Nakayoshi, Hideki: *See—*
Matsuo, Masashi; Miura, Yasushi; and Nakayoshi, Hideki, 4,592,706, Cl. 418-171.000.

Namikawa, Kazuhira: *See—*
Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,592,862, Cl. 252-511.000.

Nandi, Satyendra P.: *See—*
Babu, Suresh P.; Anderson, Gerald L.; and Nandi, Satyendra P., 4,592,762, Cl. 48-197.00R.

Narcisse, Bernadine O. Out-of-range personnel monitor and alarm. 4,593,273, Cl. 340-539.000.

Narhi, Erland D.: *See—*
Lynch, Steven K.; Narhi, Erland D.; and Walter, Frank J., 4,592,185, Cl. 52-543.000.

Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, to Shionogi & Co., Ltd. Azetidinone intermediates for cephalosporin analogs. 4,592,865, Cl. 260-239.00A.

Narishige, Shinji: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.

Narita, Ryuho; and Aoshima, Terutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric control apparatus with undervoltage protection. 4,593,180, Cl. 219-492.000.

Narita, Seiichi: *See—*
Obayashi, Hideki; Kohama, Tokio; Ina, Toshikazu; and Narita, Seiichi, 4,592,241, Cl. 73-862.340.

Nash, Greg, to Hughes Aircraft Company. Method of fabricating a CCD read only memory utilizing dual-level junction formation. 4,592,130, Cl. 29-577.00C.

Nassiri, Joe-Massoud, to Everest & Jennings. Ultra light wheelchair. 4,592,570, Cl. 280-650.000.

National Distillers and Chemical Corporation: *See—*
Rekers, Louis J.; and Katzen, Stanley J., 4,593,079, Cl. 526-100.000.

National Research Development Corp.: *See—*
Austen, Brian M.; Cliffe, Steven; Grant, David; and Hermon-Taylor, John, 4,593,018, Cl. 514-16.000.
Bromley, Jonathan S. E.; Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,593,173, Cl. 219-124.340.
Davis, Graham R.; and Brown, Thomas I. H., 4,592,369, Cl. 128-733.000.

National Semiconductor Corporation: *See—*
Single, Peter S., 4,593,208, Cl. 307-296.00R.

Nawn, George H.: *See—*
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., 4,593,108, Cl. 548-251.000.

NCR Corporation: *See—*
Bruce, Clarence A.; Koh, Yoong G.; Matwey, Paul; Maiman, Mitchell H.; Chan, Wing C.; and DeFreest, Thomas J., 4,593,227, Cl. 313-482.000.
Kleijne, Theodoor A., 4,593,384, Cl. 365-228.000.

Nebelung, Hermann H., to Emhart Industries, Inc. Apparatus for use in shearing gobs from a vertical column of plastic material. 4,592,715, Cl. 425-308.000.

NEC Corporation: *See—*
Kouyama, Toshitake, 4,593,392, Cl. 371-31.000.
Naiki, Kazuaki, 4,593,226, Cl. 313-413.000.
Tomimitsu, Yasuharu, 4,593,394, Cl. 371-39.000.

Neeb, Lothar: *See—*
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.

Neefe, Charles W. Non-optical corneal drug delivery. 4,592,752, Cl. 604-895.000.

Neely, Stephen A., to Hughes Tool Company. Upper termination with sliding sleeve seals. 4,592,426, Cl. 166-347.000.

Nehen, Ulrich: *See—*
Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., 4,592,957, Cl. 428-402.210.

Neidorff, Robert A.; and Main, W. Eric, to Motorola, Inc. Fixed slew rate bus driver circuit. 4,593,206, Cl. 307-270.000.

Nelson, Erik K.; O'Connor, Joseph G.; Boyer, David A.; and Saccocio, Edward J., to Mead Corporation, The. Magnetic brush abrasion development of imaging sheets employing photosensitive microcapsules. 4,592,986, Cl. 430-98.000.

Nelson, Stephen J.: *See—*
Dutton, Fred E.; and Nelson, Stephen J., 4,592,871, Cl. 558-2.000.

Nestec S.A.: *See—*
Akesson, Yngve R., 4,592,916, Cl. 426-517.000.
Tandy, John S., 4,592,917, Cl. 426-533.000.

Neugebauer, Dieter, to Fichtel & Sachs AG. Viscous coupling for a cooling air fan. 4,592,456, Cl. 192-58.00B.

Neuhauser, Hans-Jochem: *See—*
Buran, Ulrich; Fischer, Manfred; and Neuhauser, Hans-Jochem, 4,592,964, Cl. 428-610.000.

Neumaier, Anton; and Theissig, Werner, to Hilti Aktiengesellschaft. Removable tool holder for a hand-held drilling device or the like. 4,592,560, Cl. 279-81.000.

Neumann, Thomas E.: *See—*
Chupp, John P.; and Neumann, Thomas E., 4,593,144, Cl. 568-936.000.

Neuweg Fertigung GmbH: *See—*
Mutschler, Gunter, 4,592,247, Cl. 74-198.000.

New Cosmos Electric Co., Ltd: *See—*
Komatsu, Koji; and Sakai, Sai, 4,592,967, Cl. 428-697.000.

Newcomb, Donald R., to Butternut Electronics Co. Multi-band dipole antenna with matching stubs. 4,593,289, Cl. 343-795.000.

Newly Weds Foods, Inc.: *See—*
Yonezawa, Masayuki, 4,592,273, Cl. 99-358.000.

Nickel, Wilhelm: *See—*
Muller, Manfred; Nickel, Wilhelm; Schirmagg, Klaus-Peter; and Mailander, Engelbert, 4,592,222, Cl. 72-97.000.

Nickolaus, Harriet, to Nickolaus, Harriet. Ache and pain relieving and preventing composition. 4,592,912, Cl. 424-195.100.

NICO-PYROTECHNIK Hanns-Juergen Diederichs GmbH Co. KG: *See—*
Diederichs, Hanns-Juergen, Jr., 4,592,159, Cl. 42-1.00Z.

Nicolon Corporation: *See—*
Scales, John M.; and Wolcott, Bernard F., 4,592,675, Cl. 405-19.000.

Niebylski, Leonard M.: *See—*
Zaweski, Edward F.; and Niebylski, Leonard M., 4,592,761, Cl. 44-57.000.

Nieman, Andrew L.; and Gall, Ray A., to Dana Corporation. Slip joint seal assembly. 4,592,556, Cl. 277-27.000.

Niemi, Ingemar; and Hansson, Ingvar, to Luossavaara-Kiirunavaara Aktiebolag. Charging apparatus for cartridged explosives. 4,592,282, Cl. 102-313.000.

Niles Parts Company, Limited: *See—*
Kasai, Junichi; and Saito, Takehiko, 4,592,609, Cl. 339-42.000.

Nilssen, Ole K. Electronic microwave oven power supply. 4,593,167, Cl. 219-10.55B.

Nilsson, Erik G.: *See—*
Gabathuler, Ferdinand; and Nilsson, Erik G., 4,592,260, Cl. 83-74.000.

Nilsson, Maria: *See—*
Bijlenga, Bo; Hok, Bertil; and Nilsson, Maria, 4,592,664, Cl. 374-131.000.

Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, to Kuraray Company Limited. Process for producing isoprene. 4,593,145, Cl. 585-607.000.

Nippon Electric Co., Ltd.: *See—*
Ohnishi, Yoshitake; and Endo, Takeshi, 4,592,993, Cl. 430-313.000.

Nippon Kogaku K. K.: *See—*
Uehara, Makoto; Anzai, Satoru; and Suwa, Kyoichi, 4,592,625, Cl. 350-415.000.

Nippon Kogaku K.K.: *See—*
Ushida, Kazuo; Tanaka, Masashi; and Shimizu, Yoshiyuki, 4,592,624, Cl. 350-414.000.

Nippon Mektron Ltd: *See—*
Yamada, Okimasa, 4,592,883, Cl. 264-82.000.

Nippon Mining Co., Ltd.: *See—*
Nishikawa, Kiyoaki; and Nobuyoshi, Ryoichi, 4,592,891, Cl. 420-491.000.

Nippon Notion Kogyo Co., Ltd.: *See—*
Sodeno, Toshiaki; and Taga, Yukio, 4,592,501, Cl. 227-119.000.

Nippon Oil and Fats Co.: *See—*
Nakayama, Masaharu; Fukushi, Kyosuke; Moriya, Yasuo; and Suzuki, Nobuyoshi, 4,593,067, Cl. 525-92.000.

Nippon Oil and Fats Co., Ltd.: *See—*
Akimoto, Shin-ichi; and Suginaka, Akinori, 4,592,907, Cl. 424-70.000.

Nippon Shinyaku Co., Ltd.: *See—*
Sempuku, Kenji; Shibata, Yoshihisa; and Ohgi, Tadaaki, 4,593,025, Cl. 514-245.000.

Nippon Soken: *See—*
Obayashi, Hideki; Kohama, Tokio; Ina, Toshikazu; and Narita, Seiichi, 4,592,241, Cl. 73-862.340.

Nippon Steel Corporation: *See—*
Kawamo, Yakichiro; Suga, Yozo; Nozawa, Tadao; and Nakayama, Tadashi, 4,592,789, Cl. 148-111.000.
Saito, Shoji; Yurioka, Nobutaka; and Oshita, Shigeru, 4,593,174, Cl. 219-137.0WM.

Nippon Telegraph & Telephone Public Corporation: *See—*
Kuroda, Hideo; Mukawa, Naoki; Matsuda, Kiichi; Honma, Toshihiro; and Fukuda, Hiroshi, 4,593,267, Cl. 340-347.0DD.

Nippon Zeon Co., Ltd.: *See—*
Oyama, Motofumi; and Kubo, Yoichiro, 4,593,070, Cl. 525-139.000.

Nippondenso Co., Ltd.: *See—*
Katoh, Kazunori; and Nagao, Yasuhiro, 4,592,243, Cl. 74-7.00E.
Nakano, Kazumi; Takakuwa, Eiji; and Utsumi, Hiroo, 4,592,324, Cl. 123-424.000.
Obayashi, Hideki; Kohama, Tokio; Ina, Toshikazu; and Narita, Seiichi, 4,592,241, Cl. 73-862.340.

Nishi, Beatrice Y. Garment pattern form. 4,592,496, Cl. 223-68.000.

Nishi, Kohichi; and Takahashi, Akira, to Ricoh Company, Ltd. Stroboscopic lamp synchronizing device. 4,592,640, Cl. 354-422.000.

Nishigaki, Yuji, to Canon Kabushiki Kaisha. Multilayer electrophotographic photosensitive member. 4,592,984, Cl. 430-59.000.

Nishii, Yutaka: *See—*
Kawasaki, Sinjiro; Kitagawa, Hideo; and Nishii, Yutaka, 4,592,756, Cl. 8-527.000.

Nishikawa, Kiyoaki; and Nobuyoshi, Ryoichi, to Nippon Mining Co., Ltd. Corrosion-resistant copper alloy. 4,592,891, Cl. 420-491.000.

Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,592,942, Cl. 428-148.000.

Nishimatsu, Masaharu: *See—*
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,592,948, Cl. 428-216.000.

Nishimura, Hisao: *See—*
Takamoto, Tsutomu; Ohhashi, Yasutake; Nishimura, Hisao; Hirata, Yutaka; Okazaki, Takashi; and Yoshihara, Masahiro, 4,592,410, Cl. 164-453.000.

Nishimura, Tetsuharu: *See—*
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,592,636, Cl. 354-225.000.

Nishimura, Yukuo: *See—*
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, 4,592,980, Cl. 430-57.000.

Nishitani, Yasuhiro: *See—*
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.

Nishizawa, Jun-ichi; and Tamamushi, Takashige, to Jun-Ichi Nishizawa. Two-dimensional solid-state image pickup device. 4,593,320, Cl. 358-213.000.

Nissan Motor Company, Limited: *See—*
Kasai, Junichi; and Saito, Takehiko, 4,592,609, Cl. 339-42.000.
Kishi, Norimasa; and Noso, Kazunori, 4,593,403, Cl. 381-43.000.
Murakami, Terukiyo; Tamura, Minoru; and Inoue, Hideaki, 4,592,322, Cl. 123-361.000.
Nakagawa, Toyoaki, 4,592,325, Cl. 123-489.000.
Takeda, Hitoshi; Kishi, Norimasa; Suzuki, Tadashi; Tomikashi, Minoru; and Futami, Tooru, 4,593,154, Cl. 178-2.00D.
Yagami, Kouichi; and Matsuzaki, Kiyoto, 4,592,586, Cl. 296-218.000.

Nisshin Steel Co., Ltd.: *See—*
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,592,965, Cl. 428-621.000.

Nitardy, John H., to Boeing Company, The. FM/CW sweep linearizer and method therefor. 4,593,287, Cl. 343-17.500.

Nitschke, Reinhard, to AMP Incorporated. Electrical connector intended for use in confined areas. 4,592,611, Cl. 339-91.00R.

Nitto Electric Industrial Co., Ltd.: *See—*
Sato, Susumu; Takakura, Umiko; and Tamada, Mitsuru, 4,593,048, Cl. 514-778.000.
Yamamoto, Suguru; Sasa, Kazuaki; and Sugimoto, Toshihiko, 4,592,623, Cl. 350-397.000.

Nobuyoshi, Ryoichi: *See—*
Nishikawa, Kiyoaki; and Nobuyoshi, Ryoichi, 4,592,891, Cl. 420-491.000.

Nohren, Hubert; and Sturzenbecher, Bruno, to Autoflug GmbH. Device for the separation of a load from a belt assembly. 4,592,524, Cl. 244-151.00B.

Nolte, Margaretha: *See—*
Coetzer, Johan; and Nolte, Margaretha, 4,592,969, Cl. 429-50.000.

Nooijen, Fransiscus M. J.; and Bergmans, Christianus H. J., to U.S. Philips Corporation. Power supply circuit having two mutually independent outputs. 4,593,346, Cl. 363-21.000.

Nordson Corporation: *See—*
Toda, Masaaki; and Ichikawa, Yoshio, 4,592,495, Cl. 222-526.000.

Noreus, Sture; Lundberg, Hans; Uhlin, Lars; and Lindquist, Bengt, to Mo och Domsjo AB. Method for pre-treating lignocellulosic material in two steaming zones. 4,592,804, Cl. 162-19.000.

Norling, Brian L., to Sundstrand Data Control, Inc. Suspension system for a transducer. 4,592,234, Cl. 73-517.00B.

North American Specialties Corporation: *See—*
Seidler, Jack, 4,592,617, Cl. 339-275.00B.

Northern Telecom Limited: *See*—
Charchanko, Eugene W.; Kuhfus, Gerd; and Dragunevicius, Algirdas J., 4,593,159, Cl. 179-100.00R.
Charlebois, Leonard J.; Mariani, Renato; and Huszarik, Fred A., 4,592,721, Cl. 425-558.000.
Millar, Douglas J., 4,593,398, Cl. 375-27.000.
Still, Charles A., 4,592,528, Cl. 248-359.000.
Noso, Kazunori: *See*—
Kishi, Norimasa; and Noso, Kazunori, 4,593,403, Cl. 381-43.000.
Novak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, to TMC Corporation. Release ski binding. 4,592,569, Cl. 280-624.000.
Novatome: *See*—
Cornu, Bernard; and Lion, Rene , 4,592,888, Cl. 376-299.000.
Novinski, Edward R., to Perkin-Elmer Corporation, The. Aluminum and silica clad refractory oxide thermal spray powder. 4,593,007, Cl. 501-105.000.
Novo Industri A/S: *See*—
Rex, Jorn; and Vogeley, Otto A., 4,592,745, Cl. 604-211.000.
Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; and McDaniel, Max P., 4,593,146, Cl. 585-667.000.
Johnson, Marvin M.; and Nowack, Gerhard P., 4,593,148, Cl. 585-823.000.
Nowlin, Thomas E., to Mobil Oil Corporation. Catalyst composition for polymerizing alpha-olefins. 4,593,009, Cl. 502-107.000.
Nozawa, Tadao: *See*—
Kawamo, Yakichiro; Suga, Yozo; Nozawa, Tadao; and Nakayama, Tadashi, 4,592,789, Cl. 148-111.000.
NTN Toyo Bearing Co., Ltd.: *See*—
Egusa, Tomoyoshi; and Yamauchi, Yutaka, 4,592,172, Cl. 51-291.000.
NUKEM GmbH: *See*—
Weber, Manfred; and Dedegil, Mehmet, 4,592,226, Cl. 73-59.000.
N.V. Weefautomaten Picanol: *See*—
Vandeweghe, Michel; and Derde, Jan F., 4,592,392, Cl. 139-1.00E.
Oatman, Donald S. Athletic shoe. 4,592,154, Cl. 36-114.000.
Obayashi, Hideki; Kohama, Tokio; Ina, Toshikazu; and Narita, Seiichi, to Nippon Soken; and Nippondenso Co., Ltd. Torque detector. 4,592,241, Cl. 73-862.340.
Occidental Chemical Corporation: *See*—
Gupta, Manoj K.; and Salee, Gideon, 4,593,060, Cl. 524-397.000.
Occidental Petroleum Corporation: *See*—
Smith, Hudson C.; Atwood, Wesley W.; Myrick, John S.; and Sweat, Samuel F., 4,592,901, Cl. 423-320.000.
Oce-Nederland B.V.: *See*—
Roelofs, Johannes C. H.; Eertink, Bastiaan B. B.; and Geurts, Petrus A. M., 4,592,641, Cl. 355-3.0TR.
O'Connor, Joseph G.: *See*—
Nelson, Erik K.; O'Connor, Joseph G.; Boyer, David A.; and Saccocio, Edward J., 4,592,986, Cl. 430-98.000.
Oddo, Guiseppe: *See*—
Stanganelli, Dominick; Oddo, Guiseppe; and Sirchia, Antonino, 4,592,580, Cl. 293-136.000.
Oerlikon-Buhrle U.S.A. Inc.: *See*—
Landau, Richard F.; and Majewski, Henry A., 4,592,800, Cl. 156-643.000.
Oesterle, Gerhard; and Hutter, Wilhelm, to Aktiengesellschaft Adolph Saurer. Regulation device for the rotary drive of a supply roll device, especially a warp beam of a weaving machine. 4,593,236, Cl. 318-7.000.
Ogawa, Hidenori: *See*—
Tominaga, Michiaki; Ogawa, Hidenori; Fujioka, Takafumi; Yang, Yung-hsiung; and Nakagawa, Kazuyuki, 4,593,035, Cl. 514-312.000.
Ogawa, Hirotoshi: *See*—
Ueda, Tomoyuki; and Ogawa, Hirotoshi, 4,592,534, Cl. 251-266.000.
Ogawa, Kenji, to Idemitsu Petrochemical Co., Ltd. Web material folding device. 4,592,739, Cl. 493-415.000.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Photoconductive member having amorphous silicon layers. 4,592,985, Cl. 430-84.000.
Ogishima, Hiroaki: *See*—
Motoyama, Shimesu; Sakashita, Shizuka; Myo, Nagayoshi; Yasumi, Hirotsune; and Ogishima, Hiroaki, 4,592,302, Cl. 118-303.000.
Ogura, Satoshi; Sugiyama, Sakae; and Koga, Kazunori, to Hitachi, Ltd. Method of selecting composite reception signal in ultrasonic inspection apparatus and apparatus therefor. 4,592,237, Cl. 73-602.000.
Ohe, Takeshi: *See*—
Takeshima, Sadao; and Ohe, Takeshi, 4,593,358, Cl. 364-424.000.
Ohfuji, Yoshio: *See*—
Bando, Satoshi; Tanii, Hirokuni; and Ohfuji, Yoshio, 4,592,887, Cl. 264-337.000.
Ohgi, Tadaaki: *See*—
Sempuku, Kenji; Shibata, Yoshihisa; and Ohgi, Tadaaki, 4,593,025, Cl. 514-245.000.
Ohhashi, Yasutake: *See*—
Takamoto, Tsutomu; Ohhashi, Yasutake; Nishimura, Hisao; Hirata, Yutaka; Okazaki, Takashi; and Yoshihara, Masahiro, 4,592,410, Cl. 164-453.000.
Ohkubo, Tetsuo; and Kataoka, Hiroyuki, to Fuji Xerox Co., Ltd. Image data storing device. 4,593,324, Cl. 358-261.000.
Ohnishi, Yoshitake; and Endo, Takeshi, to Nippon Electric Co., Ltd. Pattern forming and etching process using radiation sensitive negative resist. 4,592,993, Cl. 430-313.000.
Ohno, Shigeru: *See*—
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,979, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,981, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,982, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,983, Cl. 430-57.000.
Ohnuki, Yukihiko: *See*—
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,979, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,981, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,982, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,592,983, Cl. 430-57.000.
Ohsato, Kiyoshi: *See*—
Kuwabara, Shinichiro; Ohsato, Kiyoshi; and Sugiki, Mikio, 4,593,386, Cl. 369-46.000.
Ohshima, Yoshikuni: *See*—
Ishida, Keizo; Ohshima, Yoshikuni; Mukaidani, Toyoyuki; Okouchi, Isao; and Izumi, Kenkichi, 4,592,419, Cl. 165-112.000.
Ohtsuka, Hiroo; and Ohtsuki, Tomonari, to Daiichi Denshi Kogyo Kabushiki Kaisha. Connector for memory cards. 4,592,608, Cl. 339-42.000.
Ohtsuki, Tomonari: *See*—
Ohtsuka, Hiroo; and Ohtsuki, Tomonari, 4,592,608, Cl. 339-42.000.
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, to Ricoh Company, Ltd. Copier with bookbinding function. 4,592,651, Cl. 355-72.000.
Oka, Yoshifumi: *See*—
Miyaji, Kiyoshi; Moriyama, Katutoshi; and Oka, Yoshifumi, 4,592,261, Cl. 83-102.100.
Okada, Tsutomu: *See*—
Omagari, Yasuhiko; and Okada, Tsutomu, 4,592,341, Cl. 128-4.000.
Okado, Kenji: *See*—
Mitsuhashi, Yasuo; Takenouchi, Masanori; Okado, Kenji; Imai, Eiichi; and Suematsu, Koshi, 4,592,987, Cl. 430-102.000.
Okamoto, Yasuhiro; Watanabe, Takashi; and Kubo, Motonobu, to Sanyo-Kokusaku Pulp Co., Ltd. Novel acrylates and their manufacturing methods. 4,593,121, Cl. 560-144.000.
Okawa, Takashi; and Yokoe, Nobuo, to Kyocera Corporation. Dielectric ceramic material composition. 4,593,008, Cl. 501-135.000.
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Takamoto, Tsutomu; Ohhashi, Yasutake; Nishimura, Hisao; Hirata, Yutaka; Okazaki, Takashi; and Yoshihara, Masahiro, 4,592,410, Cl. 164-453.000.
Okouchi, Isao: *See*—
Ishida, Keizo; Ohshima, Yoshikuni; Mukaidani, Toyoyuki; Okouchi, Isao; and Izumi, Kenkichi, 4,592,419, Cl. 165-112.000.
Okuma, Keiko: *See*—
Yamazaki, Kisuke; Otsubo, Michio; and Okuma, Keiko, 4,592,206, Cl. 62-160.000.
Okura Yusoki Kabushiki Kaisha: *See*—
Suizu, Dairi; Kishimoto, Taketoshi; and Hayashida, Tadahiro, 4,592,692, Cl. 414-70.000.
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Miyoshi, Takahito; Okutu, Toshimitu; and Fujiyama, Masaaki, 4,592,952, Cl. 428-323.000.
Oldson, Russell K. Economical bowling control system. 4,592,548, Cl. 273-43.00A.
Oliver, Jr. John E.; and Singer, Arnold M. Process to remove settled solids from completion brines. 4,592,425, Cl. 166-312.000.
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Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,872, Cl. 558-281.000.
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Olympus Optical Co., Ltd.: *See*—
Fujii, Tooru, 4,592,626, Cl. 350-427.000.
Ida, Masatoshi, 4,593,188, Cl. 250-204.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,593,313, Cl. 358-98.000.
Nakamura, Hiroaki, 4,592,639, Cl. 354-416.000.
Omagari, Yasuhiko; and Okada, Tsutomu, 4,592,341, Cl. 128-4.000.
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Onishi, Masayuki: *See*—
Fukayama, Miyoji; and Onishi, Masayuki, 4,593,065, Cl. 524-860.000.
Onoue, Hiroshi: *See*—
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.

Ookawa, Norio: *See—*
Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Yamamoto, Takashi, 4,592,633, Cl. 354-76.000.

Oosaki, Keiji: *See—*
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,592,965, Cl. 428-621.000.

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Takeda, Ryuzo; Ooyama, Shigeru; and Ishibashi, Yukio, 4,592,974, Cl. 429-229.000.

Oprysko, Modest M.: *See—*
Young, Peter L.; Oprysko, Modest M.; and Beranek, Mark W., 4,592,975, Cl. 430-5.000.

Orain, Michel A., to Glaenzer Spicer. Arrangement of two elements which undergo alternating relative motion and its application of slidable homokinetic joints. 4,592,735, Cl. 464-111.000.

Oren, David D.: *See—*
Oren, Donald G.; and Oren, David D., 4,592,585, Cl. 296-181.000.

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deNora, Oronzio, 4,592,822, Cl. 204-252.000.

Osaki, Takayoshi: *See—*
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,593,145, Cl. 585-607.000.

Osburn, Carlton M.: *See—*
Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., 4,592,628, Cl. 350-486.000.

Oshita, Shigeru: *See—*
Saito, Shoji; Yurioka, Nobutaka; and Oshita, Shigeru, 4,593,174, Cl. 219-137.0WM.

Osman, Robert M.; and Byington, Robert G., to Exxon Research & Engineering Co. Low severity hydrocarbon steam reforming process. 4,592,903, Cl. 423-359.000.

Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, to Exxon Research and Engineering Co. Hydroformylation catalysis by branched alkyl diaryl phosphine rhodium complexes. 4,593,141, Cl. 568-454.000.

Otis Engineering Corporation: *See—*
Hamm, Eddie J., 4,592,380, Cl. 137-155.000.

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Yamazaki, Kisuke; Otsubo, Michio; and Okuma, Keiko, 4,592,206, Cl. 62-160.000.

Otsuka Pharmaceutical Company Limited: *See—*
Tominaga, Michiaki; Ogawa, Hidenori; Fujioka, Takafumi; Yang, Yung-hsiung; and Nakagawa, Kazuyuki, 4,593,035, Cl. 514-312.000.

Otsuka, Tadao: *See—*
Inoue, Akira; and Otsuka, Tadao, 4,592,566, Cl. 280-433.000.

Otten, David M., to PepsiCo Inc. Vending machine control circuit. 4,593,361, Cl. 364-479.000.

Oujiri, Steven L.: *See—*
Hunter, Stanley M.; and Oujiri, Steven L., 4,592,947, Cl. 428-212.000.

Outboard Marine Corporation: *See—*
Bland, Gerald F., 4,592,733, Cl. 440-88.000.
Cavil, David T.; and Krueger, William R., 4,592,818, Cl. 204-196.000.
Ferguson, Arthur R., 4,592,732, Cl. 440-61.000.

Owens-Corning Fiberglas Corporation: *See—*
Seng, Stephen, 4,592,723, Cl. 432-13.000.

Oy Nokia AB: *See—*
Hallikas, Erkki T.; and Lindstrom, Lennart, 4,592,521, Cl. 242-158.00R.

Oy Wartsila AB: *See—*
Mustonen, Antero, 4,592,155, Cl. 37-54.000.

Oyama, Motofumi; and Kubo, Yoichiro, to Nippon Zeon Co., Ltd. Impact-resistant phenolic resin composition. 4,593,070, Cl. 525-139.000.

Ozaki, Hideyuki: *See—*
Fujishima, Kazuyasu; Shimotori, Kazuhiro; Ozaki, Hideyuki; and Nakano, Takao, 4,593,382, Cl. 365-149.000.

Ozaki, Takayuki, to Fujitsu Limited. Space-diversity receiving system. 4,593,413, Cl. 455-139.000.

Paap, Hans J.: *See—*
Savage, Kerry D.; and Paap, Hans J., 4,592,423, Cl. 166-248.000.

Pabst, Richard E. Flow through filter with backflush clearing capability. 4,592,848, Cl. 210-798.000.

Page, Elwin H. Sofa-bunk bed combination with pivotable cushion. 4,592,101, Cl. 5-9.00R.

Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., to Union Carbide Corporation. Process for separating methane and nitrogen. 4,592,767, Cl. 62-31.000.

Palac, Kazimir, to Zenith Electronics Corporation. Tension mask cathode ray tube. 4,593,224, Cl. 313-402.000.

Palac, Kazimir: *See—*
Dietch, Leonard; and Palac, Kazimir, 4,593,225, Cl. 313-407.000.

Palmer, Donald C., to U.S. Metal Works, Inc. Cylinder head burner. 4,592,288, Cl. 110-236.000.

Palmer, Richard C., to RCA Corporation. Analog-to-digital converter/demodulator for FM signals. 4,593,266, Cl. 340-347.0AD.

Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Panavision, Inc.: *See—*
Nabulsi, Hazem; and Kline, Donald D., 4,593,235, Cl. 315-381.000.

Pang, Sing C.; and Genna, Sebastian, to Digital Scintigraphics, Inc. Pulse pile-up discrimination system. 4,593,198, Cl. 250-366.000.

Panitz, John A., to United States of America, Energy. Field emission chemical sensor for receptor/binder, such as antigen/antibody. 4,592,894, Cl. 422-69.000.

Panoz, Donald E., to Elan Corporation P.L.C. Drug delivery device. 4,592,753, Cl. 604-897.000.

Pantaleoni, Nerio: *See—*
Borea, Giorgio; and Pantaleoni, Nerio, 4,592,109, Cl. 15-172.000.

Parisi, Joseph P., to Exxon Printing Systems, Inc. Ink jet method and apparatus. 4,593,294, Cl. 346-140.00R.

Park, Yoon B.: *See—*
Baugh, Charles R.; Hilpert, Edwin J.; Kushin, George R.; Park, Yoon B.; and Dambrackas, William A., 4,593,399, Cl. 375-104.000.

Parker-Hannifin Corporation: *See—*
Pool, Scott L., 4,592,747, Cl. 604-246.000.

Parker, John G.; and Stanbro, William D., to Johns Hopkins University, The. Electro-optical device and method for monitoring instantaneous singlet oxygen concentration produced during photoradiation using pulsed excitation and time domain signal processing. 4,592,361, Cl. 128-633.000.

Parker, Norman W., to Motorola, Inc. AM stereo transmitter. 4,593,402, Cl. 381-16.000.

Parker, Sherwood: *See—*
Shapiro, Stephen; Hyams, Bernard H.; Parker, Sherwood; and Walker, James, 4,593,381, Cl. 365-45.000.

Parrish, Lien N., to Union Carbide Corporation. Method of making aluminum-resistant titanium diboride articles. 4,592,882, Cl. 264-66.000.

Patil, Arun A. Computer-assisted tomography stereotactic system. 4,592,352, Cl. 128-303.00B.

Patzelt, Ingeborg; and Horn, Werner, to Zeiss Ikon AG. Safety lock. 4,593,185, Cl. 235-382.000.

Paulsen, Craig A.; and Meier, Thomas R., to IGT. Coin escalator. 4,592,377, Cl. 133-5.00R.

Payrhammer, Bernd: *See—*
Freitag, Friedbert; Hujer, Friedrich; Nagel, Erich; Payrhammer, Bernd; and Zahn, Wolfgang, 4,592,649, Cl. 355-43.000.

Peacock, Roy A. Hose roller. 4,592,519, Cl. 242-86.000.

Pearman, William O.; Hunt, Joseph L.; and Cunningham, William P., to GAF Corporation. Glass melter. 4,592,770, Cl. 65-128.000.

Pearson, Richard D.: *See—*
Jagger, Janine C.; Pearson, Richard D.; Guyenet, Patrice G.; and Brand, Jessica J., 4,592,744, Cl. 604-192.000.

Peck, William H.: *See—*
Foster, L. Dale; and Peck, William H., 4,592,104, Cl. 5-66.000.

Peckworth, Ralph H. Mileage recording and service reminding accessory for a shared-use vehicle. 4,593,263, Cl. 340-52.00D.

Pedemonte, Enrico: *See—*
Russo, Saverio; Alfonso, Giovanni C.; Turturro, Antonio; and Pedemonte, Enrico, 4,593,076, Cl. 525-425.000.

Peek, Jean M. Safety device for bicycle carrier for children. 4,592,592, Cl. 297-483.000.

Peiffer, Gilbert: *See—*
Mortreux, Andre ; Petit, Francis; Denis, Philippe; Buono, Gerard; and Peiffer, Gilbert, 4,593,140, Cl. 585-508.000.

Pejovic, Radovan. Electrical connector plug control. 4,592,607, Cl. 339-37.000.

Pelavin, Richard N.: *See—*
Burstein, Michael; Hong, Se J.; and Pelavin, Richard N., 4,593,363, Cl. 364-491.000.

Pelikan Aktiengesellschaft: *See—*
Mecke, Norbert; Krauter, Heinrich; and Kuchenreuther, Wieland, 4,592,945, Cl. 428-195.000.

Pellicano, Russell A.; and DelGiorno, Daniel, to Prestigeline Health Products Inc. Muscle testing method. 4,592,371, Cl. 128-774.000.

Pemsler, J. Paul; and Dempsey, Michael D., to Castle Technology Corp. Supported liquid membrane electrochemical separators. 4,592,973, Cl. 429-206.000.

Penda Corporation: *See—*
Dresen, William L.; Price, William F.; Emery, Phillip L.; and Breezer, Harlan W., 4,592,583, Cl. 296-39.00R.

Penninger, Stefan: *See—*
Knofel, Hartmut; Penninger, Stefan; Hammen, Gunther; and Heitkamper, Peter, 4,593,117, Cl. 560-025.000.

Pennison, Robert A.; and Eckman, Richard E., to Dresser Industries, Inc. Retraction apparatus for automatic feed drills or the like. 4,592,681, Cl. 408-10.000.

Pennwalt Corporation: *See—*
Bloomfield, Philip E., 4,592,727, Cl. 433-71.000.

Penton, Harold R.; Kucsma, Michael E.; and Pettigrew, F. Alexander, to Ethyl Corporation. Mammary implant. 4,592,755, Cl. 623-8.000.

PepsiCo Inc.: *See—*
Otten, David M., 4,593,361, Cl. 364-479.000.

Perdue, Vernon. Portable sluice box. 4,592,833, Cl. 209-44.000.

Perez Galan, Miguel A. Machines for weighing and selecting market garden produce and the like. 4,592,434, Cl. 177-25.000.

Perkin-Elmer Censor Anstalt: *See*—
Tabarelli, Werner; and Mayer, Herbert E., 4,592,648, Cl. 355-43.000.
Tabarelli, Werner; and Mayer, Herbert E., 4,592,650, Cl. 355-53.000.

Perkin-Elmer Corporation, The: *See*—
Grotts, Jeffrey W.; and Abreu, Rene, 4,593,187, Cl. 250-203.00R.
Novinski, Edward R., 4,593,007, Cl. 501-105.000.

Perrigo, Stephen M. Low frequency speaker enclosure. 4,592,444, Cl. 181-151.000.

Perrot, Pierre G. J. Carrying platform for receiving a goods van or container and provided with means for its adaptation to transport by road, rail and sea. 4,592,693, Cl. 414-495.000.

Pershing, David W.; Martin, George B.; and Munro, James M., to United States of America, Environmental Protection Agency. Reducing pollutant emissions from a spreader-stoker-fired furnace by stoichiometric control. 4,592,289, Cl. 110-345.000.

Person, Joel I.; and Gjelsvik, Atle, to Person, Joel I. Composite floor system. 4,592,184, Cl. 52-334.000.

Persson, Erling R., to Knorr-Bremse GmbH. Brake linkage for vehicle friction brakes. 4,592,451, Cl. 188-71.900.

Peruth, Gunther; and Lenz, Michael, to Siemens Aktiengesellschaft. Blocking oscillator switched mode power supply. 4,593,347, Cl. 363-21.000.

Peter, Cornelius; and Ruppmann, Claus, to Robert Bosch GmbH. Method of and device for adaptive feeding forward a disturbance variable in a regulator. 4,592,320, Cl. 123-339.000.

Peters, Philip H.: *See*—
Dietz, Peter W.; and Peters, Philip H., 4,592,763, Cl. 55-2.000.

Peters, Rex B., to Sundstrand Data Control, Inc. Angular base sensor utilizing parallel vibrating accelerometers. 4,592,233, Cl. 73-510.000.

Petersen, Erling N.: *See*—
Lassen, Jorgen B.; Christensen, Jorgen A.; Petersen, Erling N.; and Hansen, John B., 4,593,036, Cl. 514-317.000.

Peterson, David A.: *See*—
Feist, Barry R.; Carstens, Jerry E.; and Peterson, David A., 4,592,708, Cl. 425-80.100.

Petit, Francis: *See*—
Mortreux, Andre ; Petit, Francis; Denis, Philippe; Buono, Gerard; and Peiffer, Gilbert, 4,593,140, Cl. 585-508.000.

Petro-Drive, Inc.: *See*—
Hipp, James, 4,592,422, Cl. 166-96.000.

Petroleum Fermentations N.V.: *See*—
Williams, Joseph L.; Sansing, John W.; Hayes, Michael E.; and Deal, James F., 4,592,786, Cl. 134-22.180.

Pettigrew, F. Alexander: *See*—
Penton, Harold R.; Kucsma, Michael E.; and Pettigrew, F. Alexander, 4,592,755, Cl. 623-8.000.

Pfaffmann, George D.; and Day, Paul L., to Tocco, Inc. Apparatus for heat treating and sizing thin walled articles. 4,592,537, Cl. 266-78.000.

Pfizer Inc.: *See*—
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,593,131, Cl. 568-632.000.
Sarges, Reinhard, 4,593,037, Cl. 514-317.000.

Phelps, Peter M. Cooling tower with partially filled air inlet plenum. 4,592,877, Cl. 261-109.000.

Philip Morris Inc.: *See*—
Houminer, Yoram; and Grubbs, Harvey J., 4,592,373, Cl. 131-276.000.
Semp, Bernard A.; and Giovenco, Robert B., 4,592,698, Cl. 414-786.000.

Phillips Petroleum Company: *See*—
Bobsein, Rex L.; and Lindstrom, Merlin R., 4,593,081, Cl. 526-211.000.
Howell, Jerald A.; Tabler, Donald C.; and Haskell, Donald M., 4,592,830, Cl. 208-94.000.
Johnson, Marvin M.; Nowack, Gerhard P.; and McDaniel, Max P., 4,593,146, Cl. 585-667.000.
Johnson, Marvin M.; and Nowack, Gerhard P., 4,593,148, Cl. 585-823.000.
Washer, Stone P., 4,592,677, Cl. 405-59.000.

Pickholtz, Andrew, to Telecommunications Associates, Inc. Software protection method and apparatus. 4,593,353, Cl. 364-200.000.

Pickles, Joseph, to Ferro Manufacturing Corporation. Window regulator having C-shaped guide and flexible tape with rack teeth. 4,592,245, Cl. 74-89.210.

Piepenbrink, Ulrich: *See*—
Stein, Hermann; and Piepenbrink, Ulrich, 4,592,403, Cl. 152-158.000.

Pierce, Richard H.: *See*—
Cheney, Richard F.; and Pierce, Richard H., 4,592,781, Cl. 75-249.000.

Piersall, Raymond. Roof bolt. 4,592,687, Cl. 411-4.000.

Pietrowsky, Joseph P.: *See*—
Mammen, William R.; and Pietrowsky, Joseph P., 4,592,553, Cl. 273-240.000.

Pighetti, Antonio: *See*—
Guglielmi, Mauro; Pighetti, Antonio; Vezzani, Savino; and Acerbi, Sergio, 4,592,533, Cl. 251-30.010.

Pike, Edward R.: *See*—
McWhirter, John G.; Pike, Edward R.; and Watson, David J., 4,593,378, Cl. 364-900.000.

Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. Miticidal 1-(2-alkyl-2,3-dihydrobenzofuran-7-yl)-4-alkoxy-4-alkylsemicarbazides. 4,593,109, Cl. 549-467.000.

Pilkington Brothers P.L.C.: *See*—
Gallego, Jose M., 4,592,306, Cl. 118-719.000.

Pinto, John G. Apparatus for the diagnosis of heart conditions. 4,592,364, Cl. 128-672.000.

Piosenka, Gerald V.: *See*—
Mead, Barry B.; and Piosenka, Gerald V., 4,593,393, Cl. 371-37.000.

Pisani, Joseph A.: *See*—
Rhoe, Andrei; Pisani, Joseph A.; Hamilton, Gary L.; and Suciu, George D., 4,592,831, Cl. 208-309.000.

Piteau, Marc D.: *See*—
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,872, Cl. 558-281.000.
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,874, Cl. 558-283.000.

Pizzuto, Russell; and Schiazza, Alfred, III. Reciprocating trimming apparatus. 4,592,143, Cl. 30-216.000.

Plasencia, David B.; and Maxwell, Stewart P., to Ford Motor Company. Hydromechanical transmission with split torque and regenerative torque flow paths. 4,592,250, Cl. 74-688.000.

Plastics, Inc.: *See*—
Colato, Albert E., 4,593,171, Cl. 219-10.55M.

Plecenik, Richard M.: *See*—
Meyerson, Bernard S.; Plecenik, Richard M.; and Scott, Bruce A., 4,592,933, Cl. 427-255.100.

Pleshko, Peter: *See*—
Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., 4,592,628, Cl. 350-486.000.

Plessey Overseas Limited: *See*—
McCabe, David J.; and Sumerling, Geoffrey W., 4,593,253, Cl. 331-1.00A.

Plummer, Mark A.; and Beazley, Phillip M., to Marathon Oil Company. Conversion of hydrogen sulfide to sulfur and hydrogen. 4,592,905, Cl. 423-573.00R.

Polaroid Corporation: *See*—
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., 4,593,108, Cl. 548-251.000.
Viola, Michael S., 4,592,951, Cl. 428-323.000.

Poncept, Gerard. Apparatus for analysis of blood. 4,592,227, Cl. 73-61.400.

Ponticello, Gerald S.: *See*—
Baldwin, John J.; Varga, Sandor L.; and Ponticello, Gerald S., 4,593,039, Cl. 514-362.000.

Pool, Scott L., to Parker-Hannifin Corporation. Fluid flow sensor. 4,592,747, Cl. 604-246.000.

Poole, Brian H., to Smiths Industries Public Limited Company. Display units for aircraft. 4,592,620, Cl. 350-174.000.

Poppe, Werner; van Rijekevorsel, Rainer; Ruppender, Uwe; and Macho, Heinz, to Boehringer Mannheim GmbH. Analysis test strip. 4,592,893, Cl. 422-56.000.

Porthan, Robert J.: *See*—
Vollmuth, Lawrence P.; and Porthan, Robert J., 4,592,574, Cl. 285-31.000.

Porzel, Rainer: *See*—
Spielmann, Norbert; Gussbacher, Udo; Walter, Wolfgang; Bauer, Hermann; and Porzel, Rainer, 4,592,438, Cl. 180-89.100.

Potenziani, Ernest, II: *See*—
Leupold, Herbert A.; Potenziani, Ernest, II; Klimek, Joseph P.; and Tauber, Arthur, 4,592,889, Cl. 419-66.000.

Pouring, Andrew A., to Sonex Research Inc. Internal combustion piston engine using air chamber in piston driven in resonance with combustion wave frequency. 4,592,318, Cl. 123-295.000.

Pouring, Andrew A., to Sonex Research Inc. Combustion process for I.C. engine using a resonating air chamber in a reciprocating piston to induce closed organ pipe resonance in the combustion chamber. 4,592,331, Cl. 123-660.000.

PPG Industries, Inc.: *See*—
Bowser, George H.; Pysewski, Stanley J.; and Chiesuzzi, Renato, 4,593,175, Cl. 219-203.000.
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,592,956, Cl. 428-391.000.
Metzger, Donald D.; and Merriman, Jeffrey E., 4,592,846, Cl. 210-747.000.
Van Gemert, Barry, 4,592,776, Cl. 71-93.000.

Pradhan, Rakesh: *See*—
Leach, Jerald G.; Maan, Mohammed N.; and Pradhan, Rakesh, 4,593,279, Cl. 340-811.000.

Pratt, John W., to Abacus Municipal Limited. Column-mounted appliances. 4,592,177, Cl. 52-116.000.

Pratt & Whitney Canada Inc.: *See*—
Breitman, Daniel S.; and Dueck, Ernest G., 4,592,765, Cl. 55-306.000.

Precor Incorporated: *See*—
Smith, David B.; Miller, Randolph F.; and Moore, John M., 4,592,544, Cl. 272-73.000.

Pregermain, Jacques, to Institut Technique des Cereales et des Fourrages; and Association Generale des Producteurs de Mais. Seed-sowing element and drill for experimental plots. 4,592,484, Cl. 221-13.000.

Preis, Lothar: *See*—
Hoffmann, Jurgen; and Preis, Lothar, 4,592,421, Cl. 166-66.000.

Prestigeline Health Products Inc.: *See*—
Pellicano, Russell A.; and DelGiorno, Daniel, 4,592,371, Cl. 128-774.000.

Price, William F.: *See*—
Dresen, William L.; Price, William F.; Emery, Phillip L.; and Breezer, Harlan W., 4,592,583, Cl. 296-39.00R.

Principi, Fabio: *See—*
Armstrong, Bruce G.; Principi, Fabio; and Marcellino, John G., 4,593,383, Cl. 365-203.000.
Prior, William L.; and Sargeant, William C., to Masonite Corporation. Methods of manufacturing inorganic resin bound articles and product. 4,592,966, Cl. 428-689.000.
Priskich, Damir R. Ski boot mounting structure for facilitating monoskiing on snow. 4,592,568, Cl. 280-607.000.
Procter & Gamble Company, The: *See—*
Drobish, James L.; and McKibben, Gary E., 4,593,408, Cl. 383-43.000.
Feist, Barry R.; Carstens, Jerry E.; and Peterson, David A., 4,592,708, Cl. 425-80.100.
Proctor, Robert H.; and Anjos, Theodore R., to Murray Corporation. Hose clamp with inclined barbs. 4,592,576, Cl. 285-253.000.
Proebsting, Robert J., to Thomson Components - Mostek Corporation. Circuit for discharging bootstrapped nodes in integrated circuits with the use of transistors designed to withstand only the normal voltage. 4,593,214, Cl. 307-578.000.
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Pucket, Joe D.: *See—*
Robertson, Joeab A.; Waldorf, Virgil J.; Wilkes, Robert D.; and Pucket, Joe D., 4,592,100, Cl. 4-492.000.
Pulsar International Limited: *See—*
Carternock, Frederick A., 4,592,696, Cl. 414-685.000.
Pulse Electronics, Inc.: *See—*
Fernandez, Emilio A.; Bezos, Angel P.; and Martin, Gregory C., 4,592,217, Cl. 73-129.000.
Purex Pool Products, Inc.: *See—*
Trostler, Richard M., 4,593,177, Cl. 219-328.000.
Puskar, Halil. Roller with double left and double right helix pattern track. 4,592,463, Cl. 198-842.000.
Puydak, Robert C.; and Hazelton, Donald R., to Exxon Research & Engineering Co. Dynamically cured thermoplastic olefin polymers. 4,593,062, Cl. 524-426.000.
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Bowser, George H.; Pysewski, Stanley J.; and Chiesuzzi, Renato, 4,593,175, Cl. 219-203.000.
Quadracast, Inc.: *See—*
Tschantz, William H., 4,592,516, Cl. 241-76.000.
Quantum Corporation: *See—*
Graham, Randolph H.; and Harrison, Joel N., 4,593,194, Cl. 250-231.0SE.
Quaresima, Emma: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and DeWitt, Paolo, 4,593,043, Cl. 514-547.000.
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EerNisse, Errol P.; and Wiggins, Robert B., 4,592,663, Cl. 374-117.000.
Quay, Earl R.: *See—*
Tilson, Alan L.; Quay, Earl R.; and Knight, John C., 4,592,213, Cl. 66-9.00B.
Quill, Gary J.: *See—*
Egan, Michael J.; and Quill, Gary J., 4,592,120, Cl. 29-156.80R.
Qureshi, Shahid P.; and Gardner, Hugh C., to Union Carbide Corporation. Epoxy/aromatic amine resin systems containing aromatic trihydroxy compounds as cure accelerators. 4,593,056, Cl. 523-445.000.
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Bauman, Therese M.; Lee, Chi-Long; and Rabe, James A., 4,593,049, Cl. 521-99.000.
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Baugh, Charles R.; Hilpert, Edwin J.; Kushin, George R.; Park, Yoon B.; and Dambrackas, William A., 4,593,399, Cl. 375-104.000.
Raether, Wolfgang: *See—*
Winklemann, Erhardt; Durckheimer, Walter; and Raether, Wolfgang, 4,593,027, Cl. 514-253.000.
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Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,592,956, Cl. 428-391.000.
Ramold, Johann: *See—*
Lohse, Gerhard; Ramold, Johann; and Klee, Gerhard, 4,592,669, Cl. 400-621.000.
Ramser, Robert A., to Aluminum Company of America. Method for the control of particle size in the production of atomized metal. 4,592,879, Cl. 264-12.000.
Ramu International: *See—*
Smith-Johannsen, Robert, 4,592,859, Cl. 252-309.000.
Rancourt, James D.: *See—*
Temple, Michael D.; Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., 4,592,939, Cl. 428-64.000.
Ranke, Gerhard: *See—*
Kumman, Paul; and Ranke, Gerhard, 4,592,766, Cl. 62-18.000.
Ransburg Corporation: *See—*
Scharfenberger, James A., 4,592,305, Cl. 118-677.000.
Rasmussen, David E.: *See—*
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.
Rathe, Robert A., to FMC Corporation. Coupling and latching mechanism for extensible boom. 4,592,474, Cl. 212-267.000.
Rattba, Hubert: *See—*
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.
Raudenbusch, Werner T.: *See—*
Kooymans, Petrus G.; Stachowiak, Stephen A.; Bekooij, Jurrianus; and Raudenbusch, Werner T., 4,593,078, Cl. 525-497.000.
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Biswas, Dipak R.; and Raychaudhuri, Satyabrata, 4,592,932, Cl. 427-163.000.
Raychem Corporation: *See—*
Jansons, Viktors; and Gors, Heinrich C., 4,593,086, Cl. 528-173.000.
Jensen, Michael L.; and Claunch, Carney P., II, 4,593,181, Cl. 219-541.000.
Vogdes, Christine E.; and Andrews, Brackin L., 4,593,061, Cl. 524-417.000.
Raytheon Company: *See—*
Armstrong, Bruce G.; Principi, Fabio; and Marcellino, John G., 4,593,383, Cl. 365-203.000.
RCA Corporation: *See—*
Corboy, John F., Jr.; and Jastrzebski, Lubomir L., 4,592,792, Cl. 148-175.000.
Gurumurthy, Kadagattor V., 4,593,374, Cl. 364-900.000.
Jolly, Stuart T., 4,592,307, Cl. 118-719.000.
Levine, Peter A., 4,593,311, Cl. 358-51.000.
Long, Gerald R., 4,592,149, Cl. 33-550.000.
Martinez, Miguel R.; Andrevski, Zygmunt M.; and Mitchell, William J., Jr., 4,592,220, Cl. 72-16.000.
McDonie, Arthur F.; and Kaiser, Donald B., 4,593,229, Cl. 313-533.000.
Michaelis, Theodore D., 4,593,193, Cl. 250-231.0SE.
Mitchell, Renzo D.; Thomas, Don N.; and Smith, Richard J., 4,593,350, Cl. 364-200.000.
Palmer, Richard C., 4,593,266, Cl. 340-347.0AD.
Warren, Henry R., 4,593,330, Cl. 360-85.000.
Wignot, Leroy S., 4,593,257, Cl. 331-117.00R.
Wilbur, Leonard P., Jr., 4,592,303, Cl. 118-409.000.
Willis, Donald H.; and Christopher, Todd J., 4,593,315, Cl. 358-140.000.
Ream, Michael D.; and Guignard, Paul C., to Up-Right, Inc. Movable pedestal scaffold. 4,592,447, Cl. 182-127.000.
Reanal Finomvegyszergyar: *See—*
Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, 4,593,004, Cl. 435-181.000.
Red Fox Industries, Inc.: *See—*
Sullivan, Dennis W., III, 4,592,291, Cl. 110-346.000.
Reed, David J.: *See—*
Davis, Earl K.; Drye, James E.; and Reed, David J., 4,592,794, Cl. 156-89.000.
Reef Industries, Inc.: *See—*
Emmons, Keith, 4,592,941, Cl. 428-113.000.
Reek, Jannette van der Mei nee, executrix: *See—*
Behr, Norbert; von Ettingshausen, Othmar; Wust, Reinhold; and van der Mei, Henk, deceased, 4,592,911, Cl. 424-195.100.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; Duhault, Jacques; and Roman, Francois, to Adir, S.A.R.L. Anti-hypoxic disubstituted polymethylene imine derivatives, compositions, and method of use therefor. 4,593,026, Cl. 514-245.000.
Reif, Robert B.: *See—*
Albrechtson, Loren R.; Reif, Robert B.; and Thompson, William B., 4,593,228, Cl. 313-509.000.
Reifenhauser GmbH & Co.: *See—*
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,592,710, Cl. 425-141.000.
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, to Reifenhauser GmbH & Co. Extruder press unit for extruding thermoplastic material. 4,592,710, Cl. 425-141.000.
Reincke, Klaus: *See—*
Fikentscher, Rolf; Mertens, Heinrich; and Reincke, Klaus, 4,592,757, Cl. 8-567.000.
Fikentscher, Rolf; Mertens, Heinrich; Reincke, Klaus; and Vescia, Michele, 4,592,758, Cl. 8-567.000.
Reiner, Roland; and Weiss, Urs, to Hoffmann-La Roche Inc. Acyl derivatives. 4,593,093, Cl. 544-22.000.
Reinert, Raymond L.; and Kaufman, Charles D., to General Electric Company. Proteinaceous soil removal process. 4,592,785, Cl. 134-18.000.
Reiser, Wolf: *See—*
Kraatz, Udo; Reiser, Wolf; Buchel, Karl H.; and Lurssen, Klaus, 4,592,772, Cl. 71-76.000.
Reisman, Arnold: *See—*
Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., 4,592,628, Cl. 350-486.000.
Reitemeyer, Paul: *See—*
Reifenhauser, Hans; Beisemann, Heinz; Reitemeyer, Paul; and Grabowski, Robert, 4,592,710, Cl. 425-141.000.
Rekers, Louis J.; and Katzen, Stanley J., to National Distillers and Chemical Corporation. Resin rheology control process and catalyst therefor. 4,593,079, Cl. 526-100.000.
Rellermeyer, Heinrich; Meichsner, Walter; and Gmohling, Werner, to Thyssen Stahl AG; and SKW Trostberg AG. Method, process and composition for desulfurizing pig-iron melts. 4,592,777, Cl. 75-58.000.
Renault Vehicules Industriels: *See—*
Michel, Robert, 4,592,454, Cl. 192-3.230.

Renge, Tsumoru: *See—*
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,593,145, Cl. 585-607.000.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,592,278, Cl. 101-181.000.

Renold, Walter. Motion picture shutter method and apparatus. 4,592,632, Cl. 352-214.000.

Renzi, Ferdinando G., to Fizner Automazione di Renzi Ferdinando G. Pressurized fluid operated cylinder. 4,592,267, Cl. 92-128.000.

Resende, Irineu, to Alcan Aluminio Do Brasil S/A. Pressure cooker having vent means. 4,592,479, Cl. 220-209.000.

Rex, Jorn; and Vogeley, Otto A., to Novo Industri A/S. Dispenser. 4,592,745, Cl. 604-211.000.

Rhein, Otto H.: *See—*
Leonhardt, Heinz; and Rhein, Otto H., 4,592,477, Cl. 215-334.000.

Rheinische Maschinenfabrik & Eisengiesserei Anton Roper GmbH & Co. Kommanditgesellschaft: *See—*
Mitzner, Horst, 4,592,397, Cl. 141-18.000.

Rhoades, James J.: *See—*
Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., 4,592,518, Cl. 242-78.700.

Rhodes, William J. Rotary cutter assembly. 4,592,399, Cl. 144-229.000.

Rhoe, Andrei; Pisani, Joseph A.; Hamilton, Gary L.; and Suciu, George D., to Lummus Crest Inc. Solvent for refining of residues. 4,592,831, Cl. 208-309.000.

Rhone-Poulenc Sante: *See—*
Arnaud, Michel; and Corbet, Jean-Pierre, 4,593,101, Cl. 546-153.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Ancelle, Bernard; and Lambert, Serge, 4,592,841, Cl. 210-651.000.

Ricciardelli, Robert H.; and Sommer, Robert M., to Biochem International Inc. Gas analyzer protection system. 4,592,368, Cl. 128-719.000.

Rice, Ivan G. Compression intercooled high cycle pressure ratio gas generator for combined cycles. 4,592,204, Cl. 60-39.161.

Richter Gedeon Vegyeszeti Cyar RT: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Richter, Herbert, to Herbert Richter, Metallwaren-Apparatebau GmbH & Co. Keyholder. 4,592,219, Cl. 70-456.00R.

Ricoh Company, Ltd.: *See—*
Ikeda, Takashi; Sawayama, Noboru; and Akamatsu, Hiroyuki, 4,592,653, Cl. 355-3.0DD.
Kanda, Hajime; Murase, Katsuo; Hishida, Hiroshi; Adachi, Eiichi; Wada, Yoshinori; and Koseki, Yuji, 4,593,323, Cl. 358-256.000.
Koizumi, Yutaka, 4,592,644, Cl. 355-3.0BE.
Nishi, Kohichi; and Takahashi, Akira, 4,592,640, Cl. 354-422.000.
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, 4,592,651, Cl. 355-72.000.
Suzuki, Koichi; and Murayama, Noboru, 4,593,297, Cl. 346-160.000.
Tanaka, Hidetake, 4,593,237, Cl. 318-561.000.

Rifi, Mahmoud R., to Union Carbide Corporation. Preparation of elastomeric, chlorinated ethylene polymers. 4,593,075, Cl. 525-356.000.

Rikard, Jackie D.: *See—*
Chechovsky, Dardis W.; and Rikard, Jackie D., 4,592,218, Cl. 70-164.000.

Rikuta, Sotokazu. Constant-flow valve. 4,592,383, Cl. 137-454.600.

Ritchie, Martin T.; and Spector, George. Thermo bag. 4,592,337, Cl. 126-424.000.

Rizzo, Corrado, to Veltronic S.p.A. Remote signalling apparatus, particularly suitable for remote surveillance purposes. 4,593,274, Cl. 340-539.000.

Robbins, Eric J.; Clayton, Alan M.; White, William P.; and Leckenby, Robert E., to United Kingdom Atomic Energy Authority. Thermal test for investigating fracture mechanics of pressure vessel steels by applying thermal shock at high rotational speeds. 4,592,662, Cl. 374-57.000.

Robert Bosch GmbH: *See—*
Burkel, Rainer; and Taubitz, Bernd, 4,593,222, Cl. 310-254.000.
Gneiss, Heinz, 4,593,172, Cl. 219-85.00M.
Peter, Cornelius; and Ruppmann, Claus, 4,592,320, Cl. 123-339.000.
Schulz, Alfred, 4,592,321, Cl. 123-339.000.

Robertson, Joeab A.; Waldorf, Virgil J.; Wilkes, Robert D.; and Pucket, Joe D., to Jacuzzi Inc. Air control valve. 4,592,100, Cl. 4-492.000.

Robinson, Joseph D.: *See—*
Rubin, Sol R.; and Robinson, Joseph D., 4,592,382, Cl. 137-218.000.

Robinson, Paul J.: *See—*
Clifford, Mark J.; Hock, Robert H.; Jagunich, Douglas M.; and Robinson, Paul J., 4,593,284, Cl. 340-870.180.

Robinson, Will B. Anti-static transit case. 4,593,339, Cl. 361-215.000.

Rochette, Gerard, to U.S. Philips Corporation. Device for controlling an electrical signal by an adjustable plug. 4,593,162, Cl. 200-51.090.

Rockwell International Corporation: *See—*
Lare, Lawrence E., 4,593,281, Cl. 340-825.500.
Wiers, John W., 4,592,591, Cl. 297-375.000.

Roelofs, Johannes C. H.; Eertink, Bastiaan B. B.; and Geurts, Petrus A. M., to Oce-Nederland B.V. Image transfer device. 4,592,641, Cl. 355-3.0TR.

Rogers, Russell L., to Aeroquip Corporation. Power-assisted coupling. 4,592,387, Cl. 137-614.060.

Rohm GmbH: *See—*
Hosch, Ludwig, 4,593,064, Cl. 524-718.000.

Rohm and Haas Company: *See—*
Emmons, William D.; and Winkle, Mark R., 4,592,816, Cl. 204-180.600.
Gregory, Walter J., 4,592,823, Cl. 204-409.000.

Rohr, Wolfgang: *See—*
Eicken, Karl; Rohr, Wolfgang; Zeeh, Bernd; and Wurzer, Bruno, 4,593,104, Cl. 548-262.000.

Roj Electrotex S.p.A.: *See—*
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Rollich, Jurgen: *See—*
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Roman, Francois: *See—*
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; Duhault, Jacques; and Roman, Francois, 4,593,026, Cl. 514-245.000.

Romeo, Aurelio: *See—*
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Ronn, Torsten: *See—*
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Rosenberg, Peretz. Multiple-disc filter. 4,592,839, Cl. 210-352.000.

Rosenmund AG: *See—*
Grieder, Max; Evans, Albert D.; and Weibel, Hans, 4,592,835, Cl. 210-107.000.

Ross, Bernard. Expandable finger ring. 4,592,211, Cl. 63-15.500.

Ross, Ronald J.: *See—*
Gioffre, Anthony J.; and Ross, Ronald J., 4,592,855, Cl. 252-89.100.

Ross, Sidney D., to Sprague Electric Company. Electrolytic capacitor and spacer therefor. 4,593,343, Cl. 361-433.000.

Rothfuss, Robert G., to Senmed, Inc. Tissue retention spool for intraluminal anastomotic surgical stapling instrument and methods. 4,592,354, Cl. 128-305.000.

Rowe, David A.: *See—*
Lao, Binneg Y.; and Rowe, David A., 4,593,243, Cl. 324-158.00P.

Rowell, Lorne A., to McCormick & Company, Incorporated. Assembler for enchilada shells. 4,592,272, Cl. 99-353.000.

Royal Institution for the Advancement of Learing (McGill Univ.), The: *See—*
St-Pierre, Leon E.; Brown, G. Ronald; Henning, Dominique S.; and Bouvier, Marlene, 4,593,073, Cl. 525-328.400.

Rubin, Richard H.; and Hillman, Gary, to Machine Technology, Inc. Processing apparatus and method. 4,592,926, Cl. 427-82.000.

Rubin, Sol R.; and Robinson, Joseph D., to Aqua-Giene, Inc. Anti-siphon nozzle. 4,592,382, Cl. 137-218.000.

Ruch, Asher G., Jr. Structural joint apparatus. 4,592,672, Cl. 403-205.000.

Rudy, Richard M., Jr.: *See—*
Koos, William M., Jr.; Geis, Timothy R.; and Rudy, Richard M., Jr., 4,593,278, Cl. 340-748.000.

Ruehl, William E.; Schavilje, John N.; and Swick, Edwin G. Drop wire clamp. 4,592,117, Cl. 24-136.00R.

Ruf, Hermann: *See—*
Stedtfeld, Hans-Werner; and Strobel, Michael, 4,592,362, Cl. 128-653.000.

Ruhrchemie Aktiengesellschaft: *See—*
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, 4,593,126, Cl. 568-454.000.

Rummel, Wolfram, to Webasto-Werk W. Baier GmbH & Co. Air conditioning system for mounting on motor vehicles. 4,592,207, Cl. 62-244.000.

Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, Keith, to MDT Biologic Company. Combination steam and unsaturated chemical vapor sterilizer. 4,592,896, Cl. 422-109.000.

Ruppender, Uwe: *See—*
Poppe, Werner; van Rijekevorsel, Rainer; Ruppender, Uwe; and Macho, Heinz, 4,592,893, Cl. 422-56.000.

Ruppmann, Claus: *See—*
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Rupprecht, Hans S.; and Tiwari, Sandip, to International Business Machines Corporation. High temperature stable ohmic contact to gallium arsenide. 4,593,307, Cl. 357-67.000.

Russ, James J.; and Smith, John W. Method for recovering precious metals from precious metal-bearing materials such as ore and tailings. 4,592,779, Cl. 75-101.00R.

Russell, Steven D.: *See—*
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Russo, Saverio; Alfonso, Giovanni C.; Turturro, Antonio; and Pedemonte, Enrico, to ENICHIMICA, S.p.A. Polymer of caprolactam containing elastomeric copolyesteramide having high impact strength. 4,593,076, Cl. 525-425.000.

Ryan, James A. Ball harness. 4,592,549, Cl. 273-58.00C.

Saccocio, Edward J.: *See—*
Nelson, Erik K.; O'Connor, Joseph G.; Boyer, David A.; and Saccocio, Edward J., 4,592,986, Cl. 430-98.000.

Sadeh, Ilan. Vehicle navigation system. 4,593,359, Cl. 364-443.000.

Safronov, Andrei N.: *See—*
Zarogatsky, Leonid P.; Ivanov, Nikolai A.; Korolkov, Mikhail F.; Laubgan, Villi R.; Safronov, Andrei N.; Turkin, Vladimir Y.; and Ivanov, Boris G., 4,592,517, Cl. 241-207.000.

Sagedahl, Steven M.; German, Jeffry W.; and Wolfe, Robert M. Isokinetic exercise apparatus and method. 4,592,545, Cl. 272-125.000.

Sainomoto, Yoshinori; and Kitagawa, Fumio, to Matsushita Electric Works, Ltd. Automated blood pressure monitoring instrument. 4,592,366, Cl. 128-680.000.

St. Florian Company, Ltd.: *See—*
Klievoneit, Harold R.; and Esposito, Augustine G., 4,592,169, Cl. 51-118.000.

St-Pierre, Leon E.; Brown, G. Ronald; Henning, Dominique S.; and Bouvier, Marlene, to Royal Institution for the Advancement of Learing (McGill Univ.), The. Polymer resins with amino acid containing pendants for sorption of bile pigments and bile acids. 4,593,073, Cl. 525-328.400.

Saito, Shoji; Yurioka, Nobutaka; and Oshita, Shigeru, to Nippon Steel Corporation. Method for welding very low carbon steel. 4,593,174, Cl. 219-137.0WM.

Saito, Susumu: *See—*
Hashimoto, Akira; Saito, Susumu; Arimoto, Akira; and Morita, Kenji, 4,592,622, Cl. 350-395.000.

Saito, Takehiko: *See—*
Kasai, Junichi; and Saito, Takehiko, 4,592,609, Cl. 339-42.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member of amorphous germanium and silicon with nitrogen. 4,592,979, Cl. 430-57.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member of amorphous germanium and silicon with carbon. 4,592,981, Cl. 430-57.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member of layer of A-Ge, A-Si increasing (O) and layer of A-Si(C) or (N). 4,592,982, Cl. 430-57.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member having amorphous germanium and amorphous silicon regions with nitrogen. 4,592,983, Cl. 430-57.000.

Saitoh, Keishi: *See—*
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Sakai, Kazuya: *See—*
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Sakai, Sai: *See—*
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Sakakibara, Kouzou: *See—*
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Sakakibara, Masahiro: *See—*
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Sakano, Makoto: *See—*
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Sakanoue, Akira: *See—*
Kita, Yasushi; Nakano, Hishaji; Moroi, Shiro; and Sakanoue, Akira, 4,593,132, Cl. 570-150.000.

Sakashita, Shizuka: *See—*
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Sakata, Masataka; and Asano, Masakazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Hydraulic power piping unit for a lift truck. 4,592,449, Cl. 187-9.00E.

Sakurai, Takao: *See—*
Higuchi, Ryoichi; Honma, Masao; Sakurai, Takao; and Mikami, Naoko, 4,592,858, Cl. 252-299.660.

Sakuraya, Toshikazu: *See—*
Fujii, Tetsuya; Harada, Nobuo; Takeuchi, Shuji; Kato, Yoshiei; Nakamura, Hideo; Sakuraya, Toshikazu; and Habu, Yasuhiro, 4,592,778, Cl. 75-59.220.

Salazar, Jose A.: *See—*
Galiasso, Roberto; Salazar, Jose A.; Morales, Alfredo; and Carrasquel, Angel R., 4,592,827, Cl. 208-59.000.

Salee, Gideon: *See—*
Gupta, Manoj K.; and Salee, Gideon, 4,593,060, Cl. 524-397.000.

Salhi, Ali: *See—*
Labeeuw, Bernard; and Salhi, Ali, 4,593,022, Cl. 514-206.000.

Salk Institute Biotechnology/Industrial Associates, Inc.: *See—*
Dulbecco, Renato, 4,593,002, Cl. 435-172.300.

Salmasian, Samuel S. Method for appetite suppression and weight loss maintenance and device. 4,592,342, Cl. 128-1.00R.

Salo, Eric A. Electromagnetic drive for shaftless rotary devices. 4,593,215, Cl. 310-36.000.

Salvesen Drilling Limited: *See—*
Skene, William, 4,592,125, Cl. 29-407.000.

Sambucetti, Carlos J.: *See—*
Amelio, William J.; Jung, Dae Y.; Markovich, Voya; and Sambucetti, Carlos J., 4,593,016, Cl. 502-339.000.

Sanders Associates, Inc.: *See—*
Higa, Richard M., 4,593,293, Cl. 346-136.000.

Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,592,216, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for continuous wet-heat treatment of a cloth. 4,592,216, Cl. 68-5.00E.

Sandoz, Inc.: *See—*
Griffith, Robert W.; and Singer, Jack, 4,593,031, Cl. 514-288.000.
Winters, William C., 4,592,919, Cl. 426-568.000.

Sandstrom, Roland: *See—*
Olsson, Mats; and Sandstrom, Roland, 4,592,292, Cl. 110-347.000.

Sano, Fumiaki: *See—*
Ueda, Sei; Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Asami, Kazutomo; and Wada, Fumio, 4,592,705, Cl. 418-63.000.

Sano, Shoichi: *See—*
Furukawa, Yoshimi; and Sano, Shoichi, 4,592,561, Cl. 280-91.000.

Sanofi: *See—*
Labeeuw, Bernard; and Salhi, Ali, 4,593,022, Cl. 514-206.000.

Sanraku Incorporated: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Kouno, Kageaki; Ishikura, Tomoyuki; Yoshimoto, Akihiro; Takatsuki, Yukio; and Tobe, Hiroyasu, 4,592,999, Cl. 435-78.000.

Sansing, John W.: *See—*
Williams, Joseph L.; Sansing, John W.; Hayes, Michael E.; and Deal, James F., 4,592,786, Cl. 134-22.180.

Sansom, David J., to Emi Limited. Magnetic recording. 4,593,336, Cl. 360-131.000.

Sanyo Electric Co., Ltd.: *See—*
Maeda, Masahiko; Takashima, Masaharu; and Takeuchi, Masahira, 4,593,170, Cl. 219-10.55E.

Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Okamoto, Yasuhiro; Watanabe, Takashi; and Kubo, Motonobu, 4,593,121, Cl. 560-144.000.

Sargeant, William C.: *See—*
Prior, William L.; and Sargeant, William C., 4,592,966, Cl. 428-689.000.

Sarges, Reinhard, to Pfizer Inc. 1,3-disubstituted piperidine compounds as neuroleptic agents. 4,593,037, Cl. 514-317.000.

Sartor, Leo, to Caber Italia S.p.A. Modifiable stiffness ski. 4,592,567, Cl. 280-602.000.

Sasa, Kazuaki: *See—*
Yamamoto, Suguru; Sasa, Kazuaki; and Sugimoto, Toshihiko, 4,592,623, Cl. 350-397.000.

Sasa, Shigehiko: *See—*
Inata, Tsuguo; and Sasa, Shigehiko, 4,593,301, Cl. 357-22.000.

Sasakawa, Masumi: *See—*
Takagi, Seiichi; Hyosu, Yoshihiko; and Sasakawa, Masumi, 4,592,990, Cl. 430-137.000.

Sasaki, Junzo: *See—*
Hitomi, Mitsuo; Sasaki, Junzo; and Ueda, Kazuhiko, 4,592,310, Cl. 123-52.00M.

Sasaki, Katsutoki: *See—*
Matsutani, Kinya; and Sasaki, Katsutoki, 4,592,895, Cl. 422-106.000.

Sato, Kenichi; Takano, Satoshi; and Miyazaki, Kenji, to Sumitomo Electric Industries, Ltd. Heat-resistant galvanized iron alloy wire. 4,592,935, Cl. 428-659.000.

Sato, Mistuo: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.

Sato, Susumu; Takakura, Umiko; and Tamada, Mitsuru, to Nitto Electric Industrial Co., Ltd. Base composition for external preparations, pharmaceutical composition for external use and method of promoting percutaneous drug absorption. 4,593,048, Cl. 514-778.000.

Sato, Takao: *See—*
Arita, Setsuo; and Sato, Takao, 4,593,249, Cl. 328-137.000.

Sato, Takateru; and Shiba, Haruo, to TDK Corporation. Pressure pad device for a magnetic tape cassette. 4,593,335, Cl. 360-130.330.

Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Benzenesulfonamides as herbicides. 4,592,775, Cl. 71-90.000.

Saunders, John B.: *See—*
Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., 4,592,767, Cl. 62-31.000.

Savage, Kerry D.; and Paap, Hans J., to Texaco Inc. Hydrocarbon stratum retorting means and method. 4,592,423, Cl. 166-248.000.

Sawada, Manabu: *See—*
Naganuma, Tsutomu; Hirayama, Sigeru; Kumagai, Hiroji; Sawada, Manabu; Tanaka, Tsuneo; and Kumano, Isao, 4,592,977, Cl. 430-18.000.

Sawada, Tetsuya: *See—*
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,592,278, Cl. 101-181.000.

Sawada, Toshiharu, to Komatsu Zenoah Co. Suction device for chain saw. 4,592,445, Cl. 181-229.000.

Sawaya, Marty: *See—*
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,593,021, Cl. 514-182.000.

Sawayama, Noboru: *See—*
Ikeda, Takashi; Sawayama, Noboru; and Akamatsu, Hiroyuki, 4,592,653, Cl. 355-3.0DD.

Sawazaki, Norikazu: *See—*
Akiyama, Junichi; Chiba, Shu; and Sawazaki, Norikazu, 4,593,332, Cl. 360-111.000.

Scales, John M.; and Wolcott, Bernard F., to Nicolon Corporation. Revetment panel with staggered compartments. 4,592,675, Cl. 405-19.000.

Scandpower, Inc.: *See—*
Waring, James P.; and Smith, Robert D., 4,592,230, Cl. 73-295.000.

Schaal, Alfred: *See—*
Battagin, Gianpietro; Denis, Rene ; Ghiringhelli, Guilio; Beaubron, Alain; Guay, Phillippe; and Schaal, Alfred, 4,592,236, Cl. 73-602.000.

Schaeffel, John A., Jr.: *See—*
Madderra, Jimmy M.; and Schaeffel, John A., Jr., 4,592,525, Cl. 244-3.280.

Schaffer, Wolfgang. Elevator. 4,592,450, Cl. 187-19.000.

Scharfenberger, James A., to Ransburg Corporation. Variable low-pressure fluid color change cycle. 4,592,305, Cl. 118-677.000.

Scharia, Rubin: *See—*
Teuerstein, Avraham; Scharia, Rubin; and Sprecher, Milon, 4,592,873, Cl. 558-59.000.

Schavilje, John N.: *See—*
Ruehl, William E.; Schavilje, John N.; and Swick, Edwin G., 4,592,117, Cl. 24-136.00R.

Scheer, Peter M. Combination illuminator and lip and cheek expander. 4,592,344, Cl. 128-13.000.

Scheffer, Hans: *See—*
Damman, Ben; Drijver, Jan; Kinneging, Hans; Scheffer, Hans; Stam, Jaap; and de Witte, Paul, 4,592,803, Cl. 159-4.020.

Schelhas, Karl H.: *See—*
Kuppers, Paul D.; Schelhas, Karl H.; van den Brekel, Cornelis H. J.; and Khoe, Giok D., 4,592,924, Cl. 427-45.100.

Schering Aktiengesellschaft: *See—*
Kehr, Wolfgang; Schroder, Gertrud; Stock, Gunter; and Wachtel, Helmut, 4,593,032, Cl. 514-288.000.

Schiazza, Alfred, III: *See—*
Pizzuto, Russell; and Schiazza, Alfred, III, 4,592,143, Cl. 30-216.000.

Schihl, Raymond J., to Melvin-AHD. Linear switch positioning device. 4,592,531, Cl. 248-646.000.

Schiller, Wolfgang. Diode mixer with bias control. 4,593,411, Cl. 455-109.000.

Schirmagg, Klaus-Peter: *See—*
Muller, Manfred; Nickel, Wilhelm; Schirmagg, Klaus-Peter; and Mailander, Engelbert, 4,592,222, Cl. 72-97.000.

Schlacht, Ernst, to Weiss Etikettiertechnik GmbH+Co. KG. Device for the application of labels to cylindrical containers. 4,592,796, Cl. 156-450.000.

Schmidt, Alfred, to Ing. Alfred Schmidt GmbH. Snowblower. 4,592,156, Cl. 37-250.000.

Schmidt, Donald L.; and Harris, Robert F., to Dow Chemical Company, The. Perfluorocarbon based polymeric coatings having low critical surface tensions. 4,592,930, Cl. 427-133.000.

Schmidt, Robert L.: *See—*
Eng, Kai Y.; Haskell, Barin G.; and Schmidt, Robert L., 4,593,318, Cl. 358-142.000.

Schmidt, Walter R. Circular knitting machine for the production of cut pile. 4,592,212, Cl. 66-91.000.

Schnizler, Albrecht, to Metabowerke GmbH & Company. Guard device for hedging shears, and hedging shears. 4,592,142, Cl. 30-210.000.

Schnupp, Dale L., to Schnupp's Grain Roasting, Inc. Grain roasting drum construction. 4,592,150, Cl. 34-136.000.

Schnupp's Grain Roasting, Inc.: *See—*
Schnupp, Dale L., 4,592,150, Cl. 34-136.000.

Schouhamer Immink, Kornelis A.; and Vries, Lodewijk B., to U.S. Philips Corporation. Error correction method for the transfer of blocks of data bits, a device and performing such a method, a decoder for use with such a method, and a device comprising such a decoder. 4,593,395, Cl. 371-40.000.

Schramm, Dale E.; and Scott, Oscar T., IV, to J. M. Huber Corporation. Input assembly for high-temperature chemical reactor. 4,592,897, Cl. 422-145.000.

Schreiber, William L.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,593,143, Cl. 568-665.000.

Schroder, Gertrud: *See—*
Kehr, Wolfgang; Schroder, Gertrud; Stock, Gunter; and Wachtel, Helmut, 4,593,032, Cl. 514-288.000.

Schulz, Alfred, to Robert Bosch GmbH. Method and system for control of idle speed of an internal combustion engine. 4,592,321, Cl. 123-339.000.

Schulz, Georg; and Spector, George. Multi function air heater. 4,593,179, Cl. 219-370.000.

Schumacher, Heinz O. Process and apparatus for cleaning filter elements, especially filter cartridges. 4,592,847, Cl. 210-770.000.

Schumacher, Horst: *See—*
John, Gunter; Kretschmer, Karl-Heinz; Schumacher, Horst; and Rollich, Jurgen, 4,592,514, Cl. 241-55.000.

Schwartzman, Blake: *See—*
Hartman, James; and Schwartzman, Blake, 4,592,660, Cl. 368-286.000.

Schwarzkopf, Eugen, to Hotset Heizpatronen und Zubehor GmbH. Electric cartridge heater. 4,593,182, Cl. 219-544.000.

Schwede, Wolfgang: *See—*
Baumann, Karl-Heinz; Mang, Uli; and Schwede, Wolfgang, 4,592,571, Cl. 280-756.000.

SCM Corporation: *See—*
Hart, James A.; and Jacks, R. Keith, 4,592,480, Cl. 220-270.000.

Scott, Bruce A.: *See—*
Meyerson, Bernard S.; Plecenik, Richard M.; and Scott, Bruce A., 4,592,933, Cl. 427-255.100.

Scott, Oscar T., IV: *See—*
Schramm, Dale E.; and Scott, Oscar T., IV, 4,592,897, Cl. 422-145.000.

Scouten, Raymond E. Container and separate co-operating lid. 4,592,483, Cl. 220-379.000.

Scrivnor, Warren A., to Baltimore Aircoil Company, Inc. Rotary flow control balancing valve for cross-flow cooling towers. 4,592,878, Cl. 261-111.000.

Seager, Richard H., to King-Seeley Thermos Co. Handle mechanism for cooler or the like. 4,592,482, Cl. 220-318.000.

Secoura, Ralph A.: *See—*
Cousins, Walter K.; and Secoura, Ralph A., 4,593,220, Cl. 310-239.000.

Secretary of State: *See—*
McWhirter, John G.; Pike, Edward R.; and Watson, David J., 4,593,378, Cl. 364-900.000.

See, Jacques L., to Honeycomb Panels Patent Association, Inc., a part interest. Modular roofing system. 4,592,183, Cl. 52-309.400.

Seefeldt, William J. Unit for converting a fossil fuel burning furnace into an electrical furnace. 4,593,176, Cl. 219-279.000.

Seely, James R., to Marketing Displays, Inc. Roll-up sign with attachment strips. 4,592,158, Cl. 40-603.000.

Seely, James R.; and Hillstrom, David U., to Marketing Displays, Inc. Universal mounting bracket for gas pump toppers. 4,592,530, Cl. 248-475.100.

Sei, Kazuo: *See—*
Inoue, Hiroshi; Sezume, Tadashi; and Sei, Kazuo, 4,592,960, Cl. 428-461.000.

Seidler, Jack, to North American Specialties Corporation. Solder-bearing terminal. 4,592,617, Cl. 339-275.00B.

Seiko Epson Corporation: *See—*
Okazaki, Sakiho, 4,592,630, Cl. 351-169.000.

Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Yamamoto, Takashi, to Fuji Photo Film Co., Ltd. Photographing apparatus. 4,592,633, Cl. 354-76.000.

Sekine, Tsugio: *See—*
Sugimoto, Koichi; and Sekine, Tsugio, 4,593,366, Cl. 364-513.000.

Sekino, Teruyoshi: *See—*
Tuda, Goro; Kada, Hironosuke; Sekino, Teruyoshi; and Nagahama, Yasuhide, 4,592,697, Cl. 414-719.000.

Sekur S.p.A.: *See—*
Cappa, Giulio; and Moscatelli, Romano, 4,592,384, Cl. 137-494.000.

Selak, Martin, to Astro Machine Corporation. Suction sheet separator apparatus with plural stack capability and suction control. 4,592,542, Cl. 271-9.000.

Selfors, Donald L., to G & D Investments, Ltd. Fish fileting knife. 4,592,113, Cl. 17-66.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,593,151, Cl. 136-244.000.
Yamazaki, Shunpei, 4,593,152, Cl. 136-246.000.

Semon, Albert L. Vacuum regulator valve. 4,592,385, Cl. 137-505.130.

Semp, Bernard A.; and Giovenco, Robert B., to Philip Morris Inc. Process for removing covering material from tobacco bales. 4,592,698, Cl. 414-786.000.

Sempuku, Kenji; Shibata, Yoshihisa; and Ohgi, Tadaaki, to Nippon Shinyaku Co., Ltd. Triazine derivatives to treat pain, fever, inflammation, allergies and thrombosis. 4,593,025, Cl. 514-245.000.

Sendzimir, Tadeusz. Process and apparatus for combined steel making and spray casting. 4,592,404, Cl. 164-46.000.

Senet, Jean-Pierre G.: *See—*
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,872, Cl. 558-281.000.
Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,874, Cl. 558-283.000.

Seng, Stephen, to Owens-Corning Fiberglas Corporation. Process for reusing scrap glass. 4,592,723, Cl. 432-13.000.

Senmed, Inc.: *See—*
Rothfuss, Robert G., 4,592,354, Cl. 128-305.000.

Seres, Gabor: *See—*
Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, 4,593,004, Cl. 435-181.000.

Sermatech: *See—*
Mosser, Mark F.; and Simmons, Alfred E., Jr., 4,592,958, Cl. 428-432.000.

Set-O-Matic, Inc.: *See—*
Mercurio, Leonard, 4,592,659, Cl. 368-1.000.

Seto, Takashi: *See—*
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, 4,592,651, Cl. 355-72.000.

Seto, Yasuhiro, to Fuji Photo Film Co., Ltd. Auto-focus setting method and apparatus for printing slide films. 4,592,647, Cl. 355-40.000.

Sezume, Tadashi: *See—*
Inoue, Hiroshi; Sezume, Tadashi; and Sei, Kazuo, 4,592,960, Cl. 428-461.000.

Shanklin, James R., Jr., to A. H. Robins Company, Inc. N-[(amino)alkyl]-1-pyrrolidine, 1-piperidine and 1-homopiperidinecarboxamides (and thiocarboxamides) with sulfur linked substitution in the 2, 3 or 4-position. 4,593,102, Cl. 546-216.000.

Shapiro, Eugene: *See—*
Hong, Se J.; Nair, Ravindra K.; and Shapiro, Eugene, 4,593,351, Cl. 364-200.000.

Shapiro, Stephen; Hyams, Bernard H.; Parker, Sherwood; and Walker, James, to Leland Stanford Junior University, The Board of Trustees of the. Microplex chip for use with a microstrip detector. 4,593,381, Cl. 365-45.000.

Sharp Kabushiki Kaisha: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,593,356, Cl. 364-419.000.

Ikezaki, Katuzi; and Ishii, Kiyoshi, 4,592,764, Cl. 55-276.000.
Kadono, Masaru; Nago, Kumio; Tsuchimoto, Shuuhei; and Yoshikawa, Mitsuhiko, 4,592,923, Cl. 427-35.000.
Kiuchi, Akihiro; and Tanaka, Shinichi, 4,593,373, Cl. 364-736.000.
Matsuura, Syuuji, 4,593,255, Cl. 331-117.00R.
Tanimoto, Takuharu; Tsuda, Sounosuke; and Yamasaki, Mutsuo, 4,592,543, Cl. 271-227.000.

Shaw, Gareth L.: *See—*
Lee, William W. Y.; Shaw, Gareth L.; Clayton, James W., deceased; and Bachino, Denise, administrator, 4,592,132, Cl. 29-590.000.

Shell Oil Company: *See—*
Kooymans, Petrus G.; Stachowiak, Stephen A.; Bekooij, Jurrianus; and Raudenbusch, Werner T., 4,593,078, Cl. 525-497.000.
Pilgram, Kurt H.; and Skiles, Richard D., 4,593,109, Cl. 549-467.000.

Sherman, Earle C.; and Green, James B. P., Jr., to Johns-Manville Corporation; and Southern Tool Company, Inc. Sleeve carton end panel and flap folding and sealing assembly. 4,592,190, Cl. 53-491.000.

Sherman, William, III: *See—*
Bryce, David; and Sherman, William, III, 4,593,184, Cl. 235-449.000.

Sherwood Medical Company: *See—*
Burkholder, Richard A.; Gilson, Richard W.; and Walker, Clarence L., 4,592,746, Cl. 604-220.000.

Sheth, Umedray L.: *See—*
Bielecki, Edwin J.; Mosheim, C. Edward; and Sheth, Umedray L., 4,592,904, Cl. 423-472.000.

Sheu, Shey-Ping L.: *See—*
Kadedodi, Narayan K.; Sheu, Shey-Ping L.; and Ibrahim, Abd-El-Fattah A., 4,593,319, Cl. 358-213.000.

Shiba, Haruo: *See—*
Sato, Takateru; and Shiba, Haruo, 4,593,335, Cl. 360-130.330.

Shibata, Yoshihisa: *See—*
Sempuku, Kenji; Shibata, Yoshihisa; and Ohgi, Tadaaki, 4,593,025, Cl. 514-245.000.

Shifflett, Daniel J.: *See—*
Shifflett, David C.; Shifflett, Daniel J.; and Shifflett, Dennis I., 4,592,731, Cl. 434-184.000.

Shifflett, David C.; Shifflett, Daniel J.; and Shifflett, Dennis I., to Al-Ko Products, Inc. Teaching apparatus. 4,592,731, Cl. 434-184.000.

Shifflett, Dennis I.: *See—*
Shifflett, David C.; Shifflett, Daniel J.; and Shifflett, Dennis I., 4,592,731, Cl. 434-184.000.

Shih, Hung-Dah; and Bennett, Tommy J., to Texas Instruments Incorporated. Solderless MBE system. 4,592,308, Cl. 118-726.000.

Shih, Stuart S.: *See—*
Chu, Yung F.; and Shih, Stuart S., 4,592,828, Cl. 208-89.000.

Shikoku Chemicals Corp.: *See—*
Kamagata, Kazuo; Yamada, Toshiaki; Kawata, Shunichi; and Mizui, Takashi, 4,593,069, Cl. 525-113.000.

Shikoku Finechemicals Corp.: *See—*
Kamagata, Kazuo; Yamada, Toshiaki; Kawata, Shunichi; and Mizui, Takashi, 4,593,069, Cl. 525-113.000.

Shimalla, Charles J.: *See—*
Cancian, Annamaria C.; and Shimalla, Charles J., 4,592,943, Cl. 428-171.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,592,738, Cl. 474-80.000.

Shimizu, Kazuyuki: *See—*
Mizushima, Yoshihiro; and Shimizu, Kazuyuki, 4,593,391, Cl. 371-15.000.

Shimizu, Kenichi: *See—*
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, 4,592,651, Cl. 355-72.000.

Shimizu, Yoshiyuki: *See—*
Ushida, Kazuo; Tanaka, Masashi; and Shimizu, Yoshiyuki, 4,592,624, Cl. 350-414.000.

Shimoe, Osamu: *See—*
Kanai, Kenichi; Shimoe, Osamu; and Tashiro, Sadaji, 4,592,645, Cl. 355-14.00D.

Shimotori, Hitoshi: *See—*
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.

Shimotori, Kazuhiro: *See—*
Fujishima, Kazuyasu; Shimotori, Kazuhiro; Ozaki, Hideyuki; and Nakano, Takao, 4,593,382, Cl. 365-149.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Kobayashi, Taishi; and Akase, Shinichiro, 4,592,856, Cl. 252-162.000.
Takamizawa, Minoru; Ishihara, Toshinobu; and Yamamoto, Akira, 4,593,112, Cl. 556-480.000.

Shinohara, Takeru: *See—*
Amano, Satoru; Horiuchi, Shigenori; and Shinohara, Takeru, 4,592,621, Cl. 350-358.000.

Shionogi & Co., Ltd.: *See—*
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.

Shipley Company Inc.: *See—*
Tubergen, Timothy S.; and Benjamin, Terrell A., 4,592,929, Cl. 427-98.000.

Shirai, Shigeru: *See—*
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,592,985, Cl. 430-84.000.

Shiratsuchi, Kouji; and Nakano, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Air funnel assembly. 4,592,316, Cl. 123-195.00C.

Shop-Vac Corporation: *See—*
Berfield, Robert C., 4,592,111, Cl. 15-371.000.

Shores, Marvin W., to General Dynamics, Pomona Division. Filter/-shield for electro-explosive devices. 4,592,280, Cl. 102-202.200.

Shuman, Ralph J., to Dennison Manufacturing Company. Thermal ink transfer recording. 4,592,946, Cl. 428-200.000.

Shur, Michael, to University of Minnesota, The Regents of the. Folded logic gate. 4,593,300, Cl. 357-22.000.

Sico Incorporated: *See—*
McNamara, George E., 4,592,105, Cl. 5-238.000.

Siebold, Horst: *See—*
Forster, Helmut; Heinzelmann, Karl-Georg; Siebold, Horst; and Vetter, Jurgen, 4,593,261, Cl. 335-300.000.

Siemens Aktiengesellschaft: *See—*
Awakowicz, Erwin; and Kleine, Peter, 4,593,158, Cl. 179-100.00R.
Bialkowski, Gunter; and Bettge, Hans, 4,593,164, Cl. 200-144.00B.
Blaschke, Felix, 4,593,240, Cl. 318-800.000.
Forster, Helmut; Heinzelmann, Karl-Georg; Siebold, Horst; and Vetter, Jurgen, 4,593,261, Cl. 335-300.000.
Hieber, Konrad; and Mayer, Norbert, 4,592,921, Cl. 427-9.000.
Krause, Norbert, 4,592,363, Cl. 128-653.000.
Lohse, Gerhard; Ramold, Johann; and Klee, Gerhard, 4,592,669, Cl. 400-621.000.
Peruth, Gunther; and Lenz, Michael, 4,593,347, Cl. 363-21.000.
Steinemer, Norbert, 4,593,165, Cl. 200-144.00B.

Siemens-Allis, Inc.: *See—*
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Siemens Gammasonics, Inc.: *See—*
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Hunter, Stanley M.; and Oujiri, Steven L., 4,592,947, Cl. 428-212.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and DeWitt, Paolo, 4,593,043, Cl. 514-547.000.

Sigmund, Ludwig; Steigerwald, Franz; and Zulauf, Karlheinz, to Wella Aktiengesellschaft. Hair dye applicating apparatus. 4,592,376, Cl. 132-112.000.

Signetics Corporation: *See—*
Blauschild, Robert A., 4,593,268, Cl. 340-347.0AD.
Boyer, Richard M., 4,593,210, Cl. 307-443.000.

Sikula, John, to Waldes Truarc, Inc. Hand applicator for radially assembled spring retaining rings. 4,592,122, Cl. 29-229.000.

Silentnight Holdings PLC: *See—*
Woffendin, Arnold, 4,592,223, Cl. 72-142.000.

Siler, William M., to Kemp-Carraway Heart Institute, The. Echocardiogram machine control. 4,593,314, Cl. 358-112.000.

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Simington, George, 4,592,191, Cl. 53-509.000.

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Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert I., to USM Corporation. Linear deposition apparatus. 4,592,798, Cl. 156-578.000.

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Mosser, Mark F.; and Simmons, Alfred E., Jr., 4,592,958, Cl. 428-432.000.

Simon, Gilbert I.; and Witkin, Roy T. Dentifrices. 4,592,487, Cl. 222-94.000.

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Simon, Jack. Sobriety interlock. 4,592,443, Cl. 180-272.000.

Simon, Jozsef: *See—*
Ludwig, Gerhard; Simon, Jozsef; Zorkendorfer, Eckhard; Gappa, Gunther; Vaupel, Knut; and Klein, Jurgen, 4,592,837, Cl. 210-189.000.

Simon, Melvin L., to Vinylex Corporation. Method for securing the components of a decorative molding system. 4,592,127, Cl. 29-451.000.

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Koch, Carl, 4,592,634, Cl. 354-105.000.

Singer, Arnold M.: *See—*
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Singer Company, The: *See—*
Tolbert, Richard R.; and McCurry, Troy L., 4,592,144, Cl. 30-394.000.

Singer, Gerhard: *See—*
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Singer, Jack: *See—*
Griffith, Robert W.; and Singer, Jack, 4,593,031, Cl. 514-288.000.

Single, Peter S., to National Semiconductor Corporation. CMOS voltage and current reference circuit. 4,593,208, Cl. 307-296.00R.

Sinha, Ram R. P.: *See—*
Grimes, Frank H.; and Sinha, Ram R. P., 4,592,133, Cl. 29-605.000.

Sira Limited: *See—*
Baker, Lionel R., 4,592,684, Cl. 409-132.000.
Sirchia, Antonino: *See—*
Stanganelli, Dominick; Oddo, Guiseppe; and Sirchia, Antonino, 4,592,580, Cl. 293-136.000.
Sisk, Thomas E. Tree grate. 4,592,165, Cl. 47-25.000.
Sizelove, Cary L., Sr.: *See—*
Dietrich, William J., Sr.; Knobloch, Dean A.; and Sizelove, Cary L., Sr., 4,592,294, Cl. 111-7.000.
Skene, William, to Salvesen Drilling Limited. Method and apparatus for analysis of torque applied to a joint. 4,592,125, Cl. 29-407.000.
Skiles, Richard D.: *See—*
Pilgram, Kurt H.; and Skiles, Richard D., 4,593,109, Cl. 549-467.000.
Skolnik, Marvin B.: *See—*
Altman, Carl; Bassous, Ernest; Osburn, Carlton M.; Pleshko, Peter; Reisman, Arnold; and Skolnik, Marvin B., 4,592,628, Cl. 350-486.000.
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, to Upjohn Company, The. Use of 6-aryluracils as antiinflammatory and antiarthritic agents. 4,593,030, Cl. 514-269.000.
Skulnick, Harvey I.: *See—*
Wierenga, Wendell; and Skulnick, Harvey I., 4,593,096, Cl. 544-321.000.
SKW Trostberg AG: *See—*
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Slaats, Mathew A.; and Strange, Patrick E., to Kimball International, Inc. Hydraulic lifting mechanism for a chair or the like using a two phase working fluid. 4,592,590, Cl. 297-347.000.
Slack, Thomas B.; and Denenberg, Jeffrey N., to ITT Corporation. Probabilistic learning element. 4,593,367, Cl. 364-513.000.
Slattery, Peter F.; Foster, William R.; McLintock, Gavin A.; and Fraser, James K., to Targa Electronics Systems Inc. Electronic circuit module and holder therefor. 4,593,192, Cl. 250-229.000.
Slayman, Charles W.; and Figueroa, Luis, to Hughes Aircraft Company. Heterostructure interdigital high speed photoconductive detector. 4,593,304, Cl. 357-30.000.
Slickers, Karl, to A.R.L. Applied Research Laboratories, S.A. Method of determining elements in metals by means of optical emission spectrum analysis. 4,592,655, Cl. 356-313.000.
Sloan, Carroll D., to Echlin Inc. Read head for Wiegand Wire. 4,593,209, Cl. 307-419.000.
Smid, Albert, to U.S. Philips Corporation. Single collimator lens having one aspherical surface. 4,592,627, Cl. 350-432.000.
Smith, David B.; Miller, Randolph F.; and Moore, John M., to Precor Incorporated. Pedal-operated, stationary exercise device. 4,592,544, Cl. 272-73.000.
Smith, H. Wayne; Smith, Mark W.; and Ising, James O. Soft plastic fishing lure. 4,592,161, Cl. 43-42.240.
Smith, Herman W.: *See—*
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,593,030, Cl. 514-269.000.
Smith, Hudson C.; Atwood, Wesley W.; Myrick, John S.; and Sweat, Samuel F., to Occidental Petroleum Corporation. Method of removing suspended solids from phosphoric acid. 4,592,901, Cl. 423-320.000.
Smith, Jerry H.: *See—*
Stephen, John F.; and Smith, Jerry H., 4,593,057, Cl. 524-111.000.
Smith-Johannsen, Robert, to Ramu International. Oil-in-water or water-in-oil suspensions and uses therefor. 4,592,859, Cl. 252-309.000.
Smith, John W.: *See—*
Russ, James J.; and Smith, John W., 4,592,779, Cl. 75-101.00R.
Smith, Mark W.: *See—*
Smith, H. Wayne; Smith, Mark W.; and Ising, James O., 4,592,161, Cl. 43-42.240.
Smith, Norma W.; and Bolin, Jonathan K. Cannula holder. 4,592,351, Cl. 128-207.170.
Smith, Randall C. Power amplifier capable of simultaneous operation in two classes. 4,593,251, Cl. 330-123.000.
Smith, Richard J.: *See—*
Mitchell, Renzo D.; Thomas, Don N.; and Smith, Richard J., 4,593,350, Cl. 364-200.000.
Smith, Robert C., to Unette Corporation. Reclosable dispenser. 4,592,493, Cl. 222-212.000.
Smith, Robert D.: *See—*
Waring, James P.; and Smith, Robert D., 4,592,230, Cl. 73-295.000.
Smith, Robert J.: *See—*
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,593,030, Cl. 514-269.000.
Smith, Rosemary L.; and Collins, Scott, to Centre Suisse d'Electronique et de Microtechnique S.A. Miniature liquid junction reference electrode and an integrated solid state electrochemical sensor including the same. 4,592,824, Cl. 204-416.000.
Smith, Thomas W.; Teegarden, David M.; McGrane, Kathleen M.; and Luca, David J., to Xerox Corporation. Toner compositions containing complex ionophoric polymeric materials. 4,592,989, Cl. 430-110.000.
SmithKline Beckman Corporation: *See—*
Stringer, Orum D.; Weinstock, Joseph; and Wilson, James W., 4,593,106, Cl. 548-485.000.
Smiths Industries Public Limited Company: *See—*
Poole, Brian H., 4,592,620, Cl. 350-174.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
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Snel, Maria A.: *See—*
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Snyder, Joel B.: *See—*
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Snyder, Solomon H.; Daly, John W.; and Bruns, Robert F., to Johns Hopkins University, The. Xanthine derivatives. 4,593,095, Cl. 544-272.000.
Sobieralski, Theodore J.: *See—*
Bon, Charles K.; Kamp, Arthur J.; and Sobieralski, Theodore J., 4,592,810, Cl. 204-59.00R.
Societe a Responsabilite Limite dite: B.F.B. Estudes et Recherches Experimentales: *See—*
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Societe Chimique des Charbonnages S.A.: *See—*
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Societe de Conseils de Recherches et d'Applications Scientifiques: *See—*
Guinot, Philippe M., 4,593,020, Cl. 514-159.000.
Societe de Machines pour la Transformation des Plastiques: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Cagnon, Guy C.; Piteau, Marc D.; Senet, Jean-Pierre G.; Olofson, Roy A.; and Martz, Jonathan T., 4,592,874, Cl. 558-283.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation - S.N.E.C.M.A.: *See—*
Benoist, Rene A.; Clauzel, Michel R.; and Vandenbroucke, Roger A. J., 4,592,200, Cl. 60-261.000.
Societe Nationale Industrielle et Aerospatiale: *See—*
Le Touche, Roger A. L., 4,592,950, Cl. 428-284.000.
Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux E.F.C.I.S.: *See—*
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Sodeno, Toshiaki; and Taga, Yukio, to Nippon Notion Kogyo Co., Ltd. Button orientation apparatus. 4,592,501, Cl. 227-119.000.
Soehodho, Herman: *See—*
Benjamin, Loftus A.; Aikens, Donald T.; Gravestock, Thomas B.; and Soehodho, Herman, 4,592,771, Cl. 71-34.000.
Sollner, Robert; and Sollner, Robert. Heating or cooling apparatus. 4,592,208, Cl. 62-323.100.
Sollner, Robert: *See—*
Sollner, Robert; and Sollner, Robert, 4,592,208, Cl. 62-323.100.
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Sonex Research Inc.: *See—*
Pouring, Andrew A., 4,592,318, Cl. 123-295.000.
Pouring, Andrew A., 4,592,331, Cl. 123-660.000.
Songer, Jimmie D., to High Resolution Television, Inc. Video chroma controller gating chrominance signals by the luminance signal. 4,593,310, Cl. 358-37.000.
Sonoi, Koji: *See—*
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Sony Corporation: *See—*
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Southern Tool Company, Inc.: *See—*
Sherman, Earle C.; and Green, James B. P., Jr., 4,592,190, Cl. 53-491.000.
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Special Devices, Inc.: *See—*
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Speckhart, Frank H. Pneumatic valve return. 4,592,313, Cl. 123-90.140.
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Schulz, Georg; and Spector, George, 4,593,179, Cl. 219-370.000.
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Sperry Corporation: *See—*
Dhont, Andre G. J., 4,592,737, Cl. 474-19.000.
Miller, Harry; and Zweifel, Terry L., 4,593,285, Cl. 340-968.000.
Spielmann, Norbert; Gussbacher, Udo; Walter, Wolfgang; Bauer, Hermann; and Porzel, Rainer, to Fag Kugelfischer Georg Schafer & Co. Mounting for power-assisted master brake cylinder in an automotive vehicle. 4,592,438, Cl. 180-89.100.
Spofford, Charles J. Adjustable modules. 4,592,402, Cl. 144-346.000.
Sprague Electric Company: *See—*
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Stadtmiller, William H.; and Morris, Kenneth G., to Exxon Research and Engineering Co. Lubricating oil composition and method for providing improved thermal stability. 4,592,851, Cl. 252-32.70E.

Stahl, Peter: *See*—
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Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Drafting roller arrangement for spinning machines. 4,592,114, Cl. 19-0.250.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Suction control arrangement for an open-end friction spinning machine. 4,592,198, Cl. 57-401.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,592,114, Cl. 19-0.250.
Stahlecker, Fritz, 4,592,198, Cl. 57-401.000.
Stall, Richard A., to AT&T Bell Laboratories. Growth of oxide thin films using solid oxygen sources. 4,592,927, Cl. 427-87.000.
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Stammann, Gunter; Grolig, Johann; Becker, Robert; and Waldmann, Helmut, to Bayer Aktiengesellschaft. Process for the production of urethanes. 4,593,116, Cl. 560-24.000.
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Stanbel, Inc.: *See*—
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Hardman, Harley F.; and Beach, Ronald I., 4,593,015, Cl. 502-303.000.
Stanganelli, Dominick; Oddo, Guiseppe; and Sirchia, Antonino, to Mason, Joseph C., Jr. Bumper cushion. 4,592,580, Cl. 293-136.000.
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Ayres, Paul S.; Stark, Louis E.; Feldstein, Joel G.; and Fu, Tze-rong, 4,592,577, Cl. 285-287.000.
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Stedtfeld, Hans-Werner; and Strobel, Michael, to Ruf, Hermann. Leg-support for making restrained-object X-ray photographs of the knee joint. 4,592,362, Cl. 128-653.000.
Steigerwald, Franz: *See*—
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Stein, Edmund W. E., to Design Pak, Incorporated. Coin display case. 4,592,465, Cl. 206-0.830.
Stein, Hermann; and Piepenbrink, Ulrich, to Vorwerk & Sohn GmbH & Co. KG. Emergency operation ring for tubeless tires in motor vehicles. 4,592,403, Cl. 152-158.000.
Steinberger, Ned, to Steinberger Sound Corporation. Foldable leg rest for stringed musical instrument. 4,592,265, Cl. 84-327.000.
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Steinemer, Norbert, to Siemens Aktiengesellschaft. Vacuum switch. 4,593,165, Cl. 200-144.00B.
Steiner, Alois, to Sulzer Brothers Limited. Weft thread preparation device. 4,592,393, Cl. 139-11.000.
Stenzenberger, Horst D., to Boots Company PLC, The. Curable composition comprising bismaleimide and maleimide-amide. 4,593,083, Cl. 526-262.000.
Stephen, John F.; and Smith, Jerry H., to ICI Americas Inc. Hindered phenolic compounds derived from hexitans and stabilized compositions. 4,593,057, Cl. 524-111.000.
Stewart, Derwent G.; and Fisher, Samuel A., to Commonwealth of Australia. Thrust augmentor. 4,592,202, Cl. 60-264.000.
Still, Charles A., to Northern Telecom Limited. Leg assembly for a keyboard or the like. 4,592,528, Cl. 248-359.000.
Stith, M. Randall, Jr. Expansible support and method of use. 4,592,532, Cl. 248-649.000.
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Kehr, Wolfgang; Schroder, Gertrud; Stock, Gunter; and Wachtel, Helmut, 4,593,032, Cl. 514-288.000.
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Stone, Charles R.: *See*—
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Stone, William J., to United States of America, Energy. Automatic image acquisition processor and method. 4,593,406, Cl. 382-44.000.
Stoub, Everett W., to Siemens Gammasonics, Inc. Proximity detector for a body scanner. 4,593,189, Cl. 250-221.000.
Strand, Glen L., to TCI, Inc. Quick change gear box mounting kit for ground drive implement. 4,592,248, Cl. 74-417.000.
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Streeter, Edward C. Directional control of permanent magnet rotors. 4,593,218, Cl. 310-103.000.
Stringer, Orum D.; Weinstock, Joseph; and Wilson, James W., to SmithKline Beckman Corporation. 4-[2-(dialkylamino)ethyl]-7-hydroxyisatins. 4,593,106, Cl. 548-485.000.
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Suematsu, Koshi: *See*—
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Sugimori, Shigeru; and Goto, Yasuyuki, to Chisso Corporation. 2,3-dicyano-5-substituted pyrazines. 4,592,857, Cl. 252-299.610.
Sugimoto, Koichi; and Sekine, Tsugio, to Hitachi, Ltd. Method of controlling robot. 4,593,366, Cl. 364-513.000.
Sugimoto, Takeshi: *See*—
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Sugita, Kiyoshi; and Nakanishi, Hiroshi, to Matsushita Seiko Co., Ltd.; and Kajima Corporation. Through-wall type air conditioner. 4,592,413, Cl. 165-59.000.
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Suizu, Dairi; Kishimoto, Taketoshi; and Hayashida, Tadahiro, to Okura Yusoki Kabushiki Kaisha. Pallet loading apparatus. 4,592,692, Cl. 414-70.000.
Sullivan, Dennis W., III, to Red Fox Industries, Inc. Sewage treatment method and apparatus. 4,592,291, Cl. 110-346.000.
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Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, to Takeda Chemical Industries, Ltd. Method of producing guanosine. 4,593,000, Cl. 435-88.000.
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Summers, Warwick R.; and Cross, Rodney C., to Australian Wire Industries Pty. Ltd.; and John Lysaght Australia Limited. Determination of the thickness of a coating on a highly elongated article. 4,593,244, Cl. 324-230.000.
Sun Food Co., Ltd.: *See*—
Hara, Tatsuro, 4,592,913, Cl. 426-104.000.
Sundaram, Ravi K.: *See*—
Gupte, Pradeep M.; and Sundaram, Ravi K., 4,592,754, Cl. 623-1.000.

Sundstrand Data Control, Inc.: *See—*
Norling, Brian L., 4,592,234, Cl. 73-517.00B.
Peters, Rex B., 4,592,233, Cl. 73-510.000.

Surgical Laser Technologies Ohio, Inc.: *See—*
Daikuzono, Norio, 4,592,353, Cl. 128-303.100.

Susko, John R.: *See—*
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,592,944, Cl. 428-195.000.

Suwa, Kyoichi: *See—*
Uehara, Makoto; Anzai, Satoru; and Suwa, Kyoichi, 4,592,625, Cl. 350-415.000.

Suzanne, Jean: *See—*
Bienfait, Michel; Durand, Bernard; Suzanne, Jean; and Ungerer, Philippe, 4,593,195, Cl. 250-253.000.

Suzuki, Etsuji: *See—*
Uno, Shinichi; Suzuki, Etsuji; Douji, Ryuhachirou; and Inoue, Mituji, 4,593,309, Cl. 358-10.000.

Suzuki, Koichi; and Murayama, Noboru, to Ricoh Company, Ltd. Halftone image recording system. 4,593,297, Cl. 346-160.000.

Suzuki, Koji; Nagahira, Jyoji; and Kuroda, Kouki, to Canon Kabushiki Kaisha. Image forming apparatus with control for image forming conditions. 4,592,646, Cl. 355-14.00R.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Shock absorbing mechanism for rearview mirror assembly of motor vehicle. 4,592,529, Cl. 248-475.100.

Suzuki, Nobuyoshi: *See—*
Nakayama, Masaharu; Fukushi, Kyosuke; Moriya, Yasuo; and Suzuki, Nobuyoshi, 4,593,067, Cl. 525-92.000.

Suzuki, Shigeru: *See—*
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, 4,592,651, Cl. 355-72.000.

Suzuki, Tadashi: *See—*
Takeda, Hitoshi; Kishi, Norimasa; Suzuki, Tadashi; Tomikashi, Minoru; and Futami, Tooru, 4,593,154, Cl. 178-2.00D.

Suzuki, Toshiyuki; and Tsukakoshi, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Electroplating apparatus with ventilation means. 4,592,819, Cl. 204-203.000.

Svager, Yehuda, to Motorola, Inc. TTL to CMOS input buffer. 4,593,212, Cl. 307-475.000.

Svendsen, John M., to Tennant Company. Tool and method for scarifying a surface. 4,592,108, Cl. 15-4.000.

Svoboda, Daniel. Violin family instruments with integrating tonal arm. 4,592,264, Cl. 84-274.000.

Swarbrick, Harley E. Anchor. 4,592,300, Cl. 114-302.000.

Swarts, Richard E.: *See—*
Moffatt, E. Marston; and Swarts, Richard E., 4,592,232, Cl. 73-505.000.

Swartz, Jerome; Barkan, Edward; and Harrison, Shelley, to Symbol Technologies, Inc. Portable laser scanning system and scanning methods. 4,593,186, Cl. 235-472.000.

Sweat, Samuel F.: *See—*
Smith, Hudson C.; Atwood, Wesley W.; Myrick, John S.; and Sweat, Samuel F., 4,592,901, Cl. 423-320.000.

Swegea Maschinen AG: *See—*
Gabathuler, Ferdinand; and Nilsson, Erik G., 4,592,260, Cl. 83-74.000.

Swick, Edwin G.: *See—*
Ruehl, William E.; Schavilje, John N.; and Swick, Edwin G., 4,592,117, Cl. 24-136.00R.

Swiss Aluminium Ltd.: *See—*
Borer, Werner; Lukacs, Janos; and Spalinger, Hugo, 4,592,707, Cl. 425-7.000.
Wagner, Alfred; and Ames, Adolf, 4,592,224, Cl. 72-264.000.

Switzer, Jay A., to Union Oil Company of California. Methods of making highly conductive photoelectrochemical electrodes. 4,592,807, Cl. 204-2.100.

Sylvia, Jeffrey M.: *See—*
Van Ostrand, William F.; and Sylvia, Jeffrey M., 4,593,357, Cl. 364-424.000.

Symbol Technologies, Inc.: *See—*
Swartz, Jerome; Barkan, Edward; and Harrison, Shelley, 4,593,186, Cl. 235-472.000.

Syntex (U.S.A.) Inc.: *See—*
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,593,120, Cl. 560-107.000.
Venuti, Michael C.; and Bruno, John J., 4,593,029, Cl. 514-267.000.

System Development Corporation: *See—*
Wojtowicz, Edward A., 4,593,290, Cl. 343-900.000.

Szabo, Richard L.: *See—*
Dugan, Larry M.; Moen, Bruce A.; Rasmussen, David E.; Derks, Christopher S.; Szabo, Richard L.; Carlsen, William C.; DeRoche, Robert J.; and Ditto, James W., 4,592,720, Cl. 425-526.000.

Szanjani, Bela: *See—*
Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, 4,593,004, Cl. 435-181.000.

Szejtli, Jozsef: *See—*
Boross, Laszlo; Daroczi, Ivan; Ivony nee Kaldive, Katalin; Seres, Gabor; Szanjani, Bela; and Szejtli, Jozsef, 4,593,004, Cl. 435-181.000.

Szporny, Laszlo : *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Tabarelli, Werner; and Mayer, Herbert E., to Perkin-Elmer Censor Anstalt. Device for projection copying of masks onto a workpiece. 4,592,648, Cl. 355-43.000.

Tabarelli, Werner; and Mayer, Herbert E., to Perkin-Elmer Censor Anstalt. Apparatus for projecting a pattern on a semiconductor substrate. 4,592,650, Cl. 355-53.000.

Tabler, Donald C.: *See—*
Howell, Jerald A.; Tabler, Donald C.; and Haskell, Donald M., 4,592,830, Cl. 208-94.000.

Tachibana, Yukimasa: *See—*
Kawasaki, Tetsuji; Miyoshi, Noriomi; and Tachibana, Yukimasa, 4,593,190, Cl. 250-223.00R.

Tachikawa Spring Co., Ltd.: *See—*
Isono, Hiroyuki; and Kurosawa, Mutsuo, 4,592,588, Cl. 297-284.000.

Taga, Yukio: *See—*
Sodeno, Toshiaki; and Taga, Yukio, 4,592,501, Cl. 227-119.000.

Tagoku, Izumi: *See—*
Oikawa, Tomohiro; Shimizu, Kenichi; Suzuki, Shigeru; Tagoku, Izumi; Ishikawa, Masahiro; and Seto, Takashi, 4,592,651, Cl. 355-72.000.

Taira, Toshio: *See—*
Miyata, Teruo; and Taira, Toshio, 4,592,864, Cl. 530-356.000.

Takabatake, Mitsuo; Chiba, Jiro; and Kokubu, Yoshinori, to Asahi Glass Company, Ltd. Composition for multilayer printed wiring board. 4,593,006, Cl. 501-32.000.

Takagi, Koichi: *See—*
Irikura, Tsutomu; Takagi, Koichi; Fujimori, Shizuyoshi; and Hirata, Yoshihiro, 4,593,092, Cl. 544-6.000.

Takagi, Seiichi; Hyosu, Yoshihiko; and Sasakawa, Masumi, to Canon Kabushiki Kaisha. Process for producing toner. 4,592,990, Cl. 430-137.000.

Takahashi, Akira: *See—*
Nishi, Kohichi; and Takahashi, Akira, 4,592,640, Cl. 354-422.000.

Takahashi, Kazuhisa: *See—*
Nakamura, Yoshimitsu; Takahashi, Kazuhisa; and Mishina, Kazuhiro, 4,593,269, Cl. 340-347.00P.

Takahashi, Keiichi: *See—*
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, 4,593,097, Cl. 544-347.000.

Takahashi, Seiichi: *See—*
ujita, Tsuginobu; and Takahashi, Seiichi, 4,592,440, Cl. 180-155.000.

Takakura, Umiko: *See—*
Sato, Susumu; Takakura, Umiko; and Tamada, Mitsuru, 4,593,048, Cl. 514-778.000.

Takakuwa, Eiji: *See—*
Nakano, Kazumi; Takakuwa, Eiji; and Utsumi, Hiroo, 4,592,324, Cl. 123-424.000.

Takamatsu Electric Works, Ltd.: *See—*
Aida, Mitsuo; Kudomi, Mitsuharu; and Adachi, Toshiyuki, 4,593,276, Cl. 340-664.000.

Takamizawa, Minoru; Ishihara, Toshinobu; and Yamamoto, Akira, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a tert-hydrocarbyl silyl compound. 4,593,112, Cl. 556-480.000.

Takamoto, Tsutomu; Ohhashi, Yasutake; Nishimura, Hisao; Hirata, Yutaka; Okazaki, Takashi; and Yoshihara, Masahiro, to Sumitomo Metal Industries, Ltd. Continuous casting of thin slabs. 4,592,410, Cl. 164-453.000.

Takano, Satoshi: *See—*
Sato, Kenichi; Takano, Satoshi; and Miyazaki, Kenji, 4,592,935, Cl. 428-659.000.

Takashima, Masaharu: *See—*
Maeda, Masahiko; Takashima, Masaharu; and Takeuchi, Masahira, 4,593,170, Cl. 219-10.55E.

Takasugi, Yasufumi: *See—*
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,592,948, Cl. 428-216.000.

Takatsuki, Yukio: *See—*
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Takeda Chemical Industries, Ltd.: *See—*
Miyake, Akio; and Yamaoka, Masayoshi, 4,593,115, Cl. 560-1.000.
Sumino, Yasuhiro; Sonoi, Koji; and Doi, Muneharu, 4,593,000, Cl. 435-88.000.

Takeda, Hitoshi; Kishi, Norimasa; Suzuki, Tadashi; Tomikashi, Minoru; and Futami, Tooru, to Nissan Motor Company, Limited. Loop-type data transmission/reception network. 4,593,154, Cl. 178-2.00D.

Takeda, Koji; Sugimoto, Takeshi; and Yamada, Yusuke, to Mitsubishi Denki Kabushiki Kaisha. Constant-voltage power supply circuit. 4,593,338, Cl. 361-18.000.

Takeda, Ryuzo; Ooyama, Shigeru; and Ishibashi, Yukio, to Dowa Mining Co., Ltd. Active material for negative poles of alkaline dry cells, and method for making said material. 4,592,974, Cl. 429-229.000.

Takenouchi, Masanori: *See—*
Mitsuhashi, Yasuo; Takenouchi, Masanori; Okado, Kenji; Imai, Eiichi. and Suematsu, Koshi, 4,592,987, Cl. 430-102.000.

Takeshima, Sadao; and Ohe, Takeshi, to Jidosha Kiki Co., Ltd. Method and apparatus for controlling power steering. 4,593,358, Cl. 364-424.000.

Takeuchi, Koichi: *See—*
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi;

Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, 4,592,773, Cl. 71-88.000.
Takeuchi, Masahira: *See—*
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Takeuchi, Shuji: *See—*
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Takeuchi, Tomio: *See—*
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Talley, John J., to General Electric Company. Flame retardant polyphenylene oxide thermoplastics. 4,593,058, Cl. 524-122.000.
Tamada, Mitsuru: *See—*
Sato, Susumu; Takakura, Umiko; and Tamada, Mitsuru, 4,593,048, Cl. 514-778.000.
Tamamushi, Takashige: *See—*
Nishizawa, Jun-ichi; and Tamamushi, Takashige, 4,593,320, Cl. 358-213.000.
Tamm, Franz; Hoericke, Bernhard; and Joachim, Arnold, to VEB Stahl- und Walzwerk "Wilhelm Florin". Method for pressurized water quenching of rolled steel products. 4,592,788, Cl. 148-12.00B.
Tamura, Minoru: *See—*
Murakami, Terukiyo; Tamura, Minoru; and Inoue, Hideaki, 4,592,322, Cl. 123-361.000.
Tanabe, Yoshiyuki: *See—*
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Tanahashi, Toshiyuki: *See—*
Nakajima, Kazuo; and Tanahashi, Toshiyuki, 4,592,791, Cl. 148-171.000.
Tanaka, Hidetake, to Ricoh Company Ltd. Servo-system having an adjustment indicator. 4,593,237, Cl. 318-561.000.
Tanaka, Kenzou: *See—*
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Tanaka, Masashi: *See—*
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Tanaka, Shinichi: *See—*
Kiuchi, Akihiro; and Tanaka, Shinichi, 4,593,373, Cl. 364-736.000.
Tanaka, Souhei; Mori, Kazuhiro; and Itemadani, Eiji, to Matsushita Electric Industrial Co., Ltd. Method of circuit connection across both surfaces of substrate. 4,592,137, Cl. 29-843.000.
Tanaka, Tsuneo: *See—*
Naganuma, Tsutomu; Hirayama, Sigeru; Kumagai, Hiroji; Sawada, Manabu; Tanaka, Tsuneo; and Kumano, Isao, 4,592,977, Cl. 430-18.000.
Tanaka, Yoshinori; Sakai, Kazuya; Kouno, Toshiyuki; Itakura, Mithuo; Takeuchi, Koichi; Enomoto, Yuji; Shimotori, Hitoshi; Inami, Shunichi; Hojo, Yoshikata; and Sakakibara, Masahiro, to Mitsui Toatsu Chemicals, Incorporated. Substituted propargyloxyacetonitrile derivatives, process for production thereof, and herbicide and agricultural-horticultural fungicide comprising said derivatives as active ingredients. 4,592,773, Cl. 71-88.000.
Tandy, John S., to Nestec S.A. Chicken flavorants and processes for preparing them. 4,592,917, Cl. 426-533.000.
Tanii, Hirokuni: *See—*
Bando, Satoshi; Tanii, Hirokuni; and Ohfuji, Yoshio, 4,592,887, Cl. 264-337.000.
Tanimoto, Takuharu; Tsuda, Sounosuke; and Yamasaki, Mutsuo, to Sharp Kabushiki Kaisha. Original document automatic feeding arrangement for use in copying apparatus and the like. 4,592,543, Cl. 271-227.000.
Taoka Chemical Company, Limited: *See—*
Kawasaki, Sinjiro; Kitagawa, Hideo; and Nishii, Yutaka, 4,592,756, Cl. 8-527.000.
Tapco Products Company, Inc.: *See—*
Chubb, Arthur B.; MacLeod, Richard J.; and Rhoades, James J., 4,592,518, Cl. 242-78.700.
Targa Electronics Systems Inc.: *See—*
Slattery, Peter F.; Foster, William R.; McLintock, Gavin A.; and Fraser, James K., 4,593,192, Cl. 250-229.000.
Tashiro, Sadaji: *See—*
Kanai, Kenichi; Shimoe, Osamu; and Tashiro, Sadaji, 4,592,645, Cl. 355-14.00D.
Taubenmann, Peter, to Elastogran Maschinenbau GmbH. Mixing head for producing a preferably chemically reactive mixture of two or more plastics components. 4,592,657, Cl. 366-134.000.
Tauber, Arthur: *See—*
Leupold, Herbert A.; Potenziani, Ernest, II; Klimek, Joseph P.; and Tauber, Arthur, 4,592,889, Cl. 419-66.000.
Taubitz, Bernd: *See—*
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Taucher, Robert: *See—*
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Taylor, Joseph D. F.; and Wiley, David, to Lucas Industries Public Limited Company. Lamp drive circuit. 4,593,233, Cl. 315-307.000.
Taylor, Lloyd D.: *See—*
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., 4,593,108, Cl. 548-251.000.
Taylor, William A., to International Fuel Cells Corporation. Coke and graphite filled separator plate for electrochemical cells. 4,592,968, Cl. 429-34.000.
TCI, Inc.: *See—*
Strand, Glen L., 4,592,248, Cl. 74-417.000.
TDK Corporation: *See—*
Kohmoto, Osamu; Takasugi, Yasufumi; Sugihara, Hiroshi; and Nishimatsu, Masaharu, 4,592,948, Cl. 428-216.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,592,942, Cl. 428-148.000.
Sato, Takateru; and Shiba, Haruo, 4,593,335, Cl. 360-130.330.
Teac Corporation: *See—*
Hayakawa, Yuji, 4,593,329, Cl. 360-75.000.
Tecnoma: *See—*
Ballu, Patrick J. M., 4,592,164, Cl. 47-1.500.
Teegarden, David M.: *See—*
Smith, Thomas W.; Teegarden, David M.; McGrane, Kathleen M.; and Luca, David J., 4,592,989, Cl. 430-110.000.
Teepak, Inc.: *See—*
Bridgeford, Douglas J., 4,592,795, Cl. 156-203.000.
Tekflo Limited: *See—*
Cutler, George D., 4,592,239, Cl. 73-861.660.
Tektronix, Inc.: *See—*
Bristol, L. Rodney; Hillman, Alfred K., Jr.; and Law, William Q., 4,593,242, Cl. 324-121.00R.
Telecommunications Associates, Inc.: *See—*
Pickholtz, Andrew, 4,593,353, Cl. 364-200.000.
Temple, Michael D.; Mayer, Thomas; Boling, Norman L.; and Rancourt, James D., to Burroughs Corporation. Method of rendering uniform coating on disks and product. 4,592,939, Cl. 428-64.000.
Tendrup, Donald L.; and Devito, Joseph P. Multiple section hanging planter. 4,592,166, Cl. 47-67.000.
Tennant Company: *See—*
Svendsen, John M., 4,592,108, Cl. 15-4.000.
Teramoto, Yoshikichi: *See—*
Mizuno, Toshiya; Teramoto, Yoshikichi; and Murayama, Naohiro, 4,592,949, Cl. 428-224.000.
Teraoka, Syoichi. Apparatus for molding hollow plastic articles. 4,592,718, Cl. 425-504.000.
Terashima, Tuneo: *See—*
Yamaguchi, Terumoto; and Terashima, Tuneo, 4,592,407, Cl. 164-265.000.
Ternynck, Therese M. F.: *See—*
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Tesch, Hugo: *See—*
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Teuerstein, Avraham; Scharia, Rubin; and Sprecher, Milon, to Bromine Compounds, Ltd. Sulfur-containing halogenated esters of neopentyl alcohol and methods for their preparation. 4,592,873, Cl. 558-59.000.
Tewesmeier, Werner, to Autola Stromrichter GmbH & Co. KG. Device for the generation of regulated and/or adjustable direct voltages or direct currents. 4,593,348, Cl. 363-85.000.
Tews, Fritz: *See—*
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Texaco Inc.: *See—*
Caggiano, Michael A., 4,592,899, Cl. 422-180.000.
Darden, Jerome W.; and McEntire, Edward E., 4,592,853, Cl. 252-75.000.
Long, Stephen L.; and Brown, Alfred, 4,592,424, Cl. 166-263.000.
Savage, Kerry D.; and Paap, Hans J., 4,592,423, Cl. 166-248.000.
Texas Instruments Incorporated: *See—*
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Shih, Hung-Dah; and Bennett, Tommy J., 4,592,308, Cl. 118-726.000.
TGK Company, Limited: *See—*
Hirota, Hisatoshi; and Hara, Toyoyuki, 4,593,166, Cl. 200-83.00J.
Thaxton, George K. Tennis practice and game apparatus. 4,592,547, Cl. 273-29.00A.
Thayer, William L.: *See—*
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Theissig, Werner: *See—*
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Thiagarajan, Natarajan: *See—*
Ilgner, Hartmut; Thiagarajan, Natarajan; Heck, Gunter; and Lienerth, Aladar, 4,592,806, Cl. 203-71.000.
Thomas, Don N.: *See—*
Mitchell, Renzo D.; Thomas, Don N.; and Smith, Richard J., 4,593,350, Cl. 364-200.000.
Thomas, Dustin H.: *See—*
Wilson, R. Woodrow, Jr.; and Thomas, Dustin H., 4,593,129, Cl. 568-716.000.
Thomas, Perry W. Water heater. 4,593,169, Cl. 219-10.55R.
Thomasson, Daniel: *See—*
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Thompson, Roger A., to Adolph Coors Company. Monitoring system for a container testing machine. 4,593,369, Cl. 364-552.000.
Thompson, William B.: *See—*
Albrechtson, Loren R.; Reif, Robert B.; and Thompson, William B., 4,593,228, Cl. 313-509.000.
Thomson Components - Mostek Corporation: *See—*
Chen, Charles C., 4,592,481, Cl. 220-307.000.
Proebsting, Robert J., 4,593,214, Cl. 307-578.000.
Thomson-CSF: *See—*
Fourcade, Pierre; and Dupray, Dominique, 4,593,379, Cl. 364-900.000.

Girault, Herve; Gauthier, Francois H.; and Thomasson, Daniel, 4,592,654, Cl. 356-247.000.
Huignard, Jean-Pierre; and Arditty, Herve , 4,592,618, Cl. 350-3.610.
Thomson, Loronzo H., to Little Rapids Corp. Method for making specimen containers. 4,592,884, Cl. 264-132.000.
Thornock, Russel L., to Boeing Company, The. Translating jet engine nozzle plug. 4,592,508, Cl. 239-265.190.
Thumm, Helmut: *See—*
Musselmann, Walter; Bahr, Theodor; and Thumm, Helmut, 4,592,513, Cl. 241-46.170.
Thygeson, Lester R. Folding table. 4,592,287, Cl. 108-113.000.
Thyssen Stahl AG: *See—*
Rellermeyer, Heinrich; Meichsner, Walter; and Gmohling, Werner, 4,592,777, Cl. 75-58.000.
Tidmore, Richard D. Bellows-type container for liquids. 4,592,492, Cl. 222-209.000.
Tienkamp, Engbert: *See—*
Blom, Hendrik; Stok, Filippus L.; and Tienkamp, Engbert, 4,593,321, Cl. 358-219.000.
Tilson, Alan L.; Quay, Earl R.; and Knight, John C., to Mayer, Wildman Industries, Inc. Pneumatic fiber recovery and redistribution system for sliver high pile fabric knitting machines. 4,592,213, Cl. 66-9.00B.
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and DeWitt, Paolo, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Mercapto acyl-carnitines and pharmaceutical compositions containing same. 4,593,043, Cl. 514-547.000.
Tiwari, Sandip: *See—*
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TMC Corporation: *See—*
Novak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,592,569, Cl. 280-624.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
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Tobe, Hiroyasu: *See—*
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Tobey, James F., Jr.: *See—*
Goyette, Lewis E.; and Tobey, James F., Jr., 4,592,915, Cl. 426-321.000.
Tocco, Inc.: *See—*
Pfaffmann, George D.; and Day, Paul L., 4,592,537, Cl. 266-78.000.
Toda, Masaaki; and Ichikawa, Yoshio, to Nordson Corporation. Automatic gun for discharging thermoplastic resin. 4,592,495, Cl. 222-526.000.
Toguchi, Seiichi; and Kobayashi, Makoto, to Ebara Corporation. Vortex pump. 4,592,700, Cl. 415-213.00A.
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, to Rengo Co., Ltd. Printing apparatus. 4,592,278, Cl. 101-181.000.
Tokuyama Sekisui Industry, Corporation Limited: *See—*
Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,592,862, Cl. 252-511.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Akiyama, Junichi; Chiba, Shu; and Sawazaki, Norikazu, 4,593,332, Cl. 360-111.000.
Bandai, Yoshiaki; and Hasebe, Khoki, 4,593,372, Cl. 364-719.000.
Fukatsu, Kunio, 4,593,183, Cl. 235-379.000.
Iwahashi, Hiroshi; and Asano, Masamichi, 4,593,203, Cl. 307-202.100.
Narita, Ryuho; and Aoshima, Terutaka, 4,593,180, Cl. 219-492.000.
Tomita, Seiji, 4,593,331, Cl. 360-93.000.
Uno, Shinichi; Suzuki, Etsuji; Douji, Ryuhachirou; and Inoue, Mituji, 4,593,309, Cl. 358-10.000.
Ushiro, Sotaro, 4,593,354, Cl. 364-200.000.
Tolbert, Richard R.; and McCurry, Troy L., to Singer Company, The. Molded scroller saw lock button spring. 4,592,144, Cl. 30-394.000.
Tomatis, Stefano, to CMT Costruzioni Meccaniche e Tecnologie S.p.A. Stretching and moulding machine for pasta filata cheese. 4,592,274, Cl. 99-452.000.
Tomei, Edmardo J. Solar powered vehicle. 4,592,436, Cl. 180-2.200.
Tomida, Yoshinori; Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Hamamoto, Takashi, to Canon Kabushiki Kaisha. Photoconductive layer having hydrophilic and hydrophobic moieties. 4,592,980, Cl. 430-57.000.
Tomikashi, Minoru: *See—*
Takeda, Hitoshi; Kishi, Norimasa; Suzuki, Tadashi; Tomikashi, Minoru; and Futami, Tooru, 4,593,154, Cl. 178-2.00D.
Tomimitsu, Yasuharu, to NEC Corporation. Method capable of simultaneously decoding two reproduced sequences. 4,593,394, Cl. 371-39.000.
Tominaga, Michiaki; Ogawa, Hidenori; Fujioka, Takafumi; Yang, Yung-hsiung; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Company Limited. Carbostyril derivatives. 4,593,035, Cl. 514-312.000.
Tomita, Fusao; Takahashi, Keiichi; Kawamoto, Isao; Asano, Kozo; Morimoto, Makoto; Ashizawa, Tadashi; and Fujimoto, Kazuhisa, to Kyowa Hakko Kogyo Co., Ltd. Phenazine carboxylic acid derivatives and a process for production thereof. 4,593,097, Cl. 544-347.000.
Tomita, Seiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape player. 4,593,331, Cl. 360-93.000.
Tomlinson, Barrett L., to Spectra-Physics, Inc. Method and apparatus for optimizing peak detection in a chromatogram. 4,592,842, Cl. 210-659.000.
Tong, George K. K., to Chane Hwa Manufacturing Co. Ltd.; Tung Ming Electrical Co. Ltd.; and Chane Hwa Electrical Co. Ltd. Replaceable fuse add-on plug. 4,592,613, Cl. 339-147.00P.
Toppan Printing Co., Ltd.: *See—*
Naganuma, Tsutomu; Hirayama, Sigeru; Kumagai, Hiroji; Sawada, Manabu; Tanaka, Tsuneo; and Kumano, Isao, 4,592,977, Cl. 430-18.000.
Topping, Donald G. Arrow rest device. 4,592,332, Cl. 124-41.00A.
Toray Engineering Co., Ltd.: *See—*
Miyaji, Kiyoshi; Moriyama, Katutoshi; and Oka, Yoshifumi, 4,592,261, Cl. 83-102.100.
Toray Silicone Company, Ltd.: *See—*
Fukayama, Miyoji; and Onishi, Masayuki, 4,593,065, Cl. 524-860.000.
Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.
Tornqvist, Peter J. T. Device for deposition of the movements of two driven bodies in the forward direction of a tool. 4,592,431, Cl. 173-103.000.
Torres, John R.: *See—*
Vesce, Richard V.; and Torres, John R., 4,593,213, Cl. 307-564.000.
Toska Co., Ltd.: *See—*
Kato, Masami, 4,592,499, Cl. 227-67.000.
Kato, Masami, 4,592,500, Cl. 227-67.000.
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, to Richter Gedeon Vegyeszeti Cyar RT. Process for the preparation of 3-trifluoromethyl-and 2,5-dimethyl-4'-hdyroxy-α-ethyl-benzhydrol, and pharmaceutical compositions containing them. 4,593,047, Cl. 514-726.000.
Toyama, Eiji; and Sugano, Akira, to Hitachi, Ltd. Method of controlling an air heater of a coal-fired boiler. 4,592,293, Cl. 110-347.000.
Toyo Ink Mfg. Co., Ltd.: *See—*
Naganuma, Tsutomu; Hirayama, Sigeru; Kumagai, Hiroji; Sawada, Manabu; Tanaka, Tsuneo; and Kumano, Isao, 4,592,977, Cl. 430-18.000.
Toyoda Gosei Co., Ltd.: *See—*
Nagata, Takuji; and Itou, Isao, 4,592,937, Cl. 428-31.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Yamada, Ryuichi; Hirokawa, Toshio; and Goto, Toshihiro, 4,592,389, Cl. 137-625.220.
Toyota Jidosha Kabushiki Kaisha: *See—*
Kobayashi, Nobuyuk; Hattori, Takashi; and Ito, Toshimitsu, 4,592,315, Cl. 123-188.00M.
Matsuo, Masashi; Miura, Yasushi; and Nakayoshi, Hideki, 4,592,706, Cl. 418-171.000.
Yokoya, Yuji; Buma, Shuuichi; and Araki, Hitoshi, 4,592,540, Cl. 267-8.00R.
Tracer Technologies, Inc.: *See—*
Walsh, Fraser M., 4,592,971, Cl. 429-105.000.
Transamerica Delaval Inc.: *See—*
Wheable, Desmond, 4,592,665, Cl. 374-143.000.
Transpec, Inc.: *See—*
Lamparter, Ronald C., 4,592,269, Cl. 98-2.140.
Trautloff, Gary. Axle assembly for all-terrain and like vehicles. 4,592,596, Cl. 301-132.000.
Trivedi, Bharat K.: *See—*
Bristol, James A.; Moos, Walter; and Trivedi, Bharat K., 4,593,019, Cl. 514-46.000.
Trostler, Richard M., to Purex Pool Products, Inc. Reduced differential, high limit thermostat system. 4,593,177, Cl. 219-328.000.
Troy, Michael, to Engineering Resources, Inc. Multiple stage device for condensate removal from a steam piping system. 4,592,381, Cl. 137-203.000.
Trubiano, Antoine, to Cari-All Inc. Shelf corner support structure. 4,592,286, Cl. 108-108.000.
True, Richard B., to Litton Systems, Inc. Dual-mode electron gun. 4,593,230, Cl. 315-14.000.
Trunko, David W.: *See—*
Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., 4,592,988, Cl. 430-107.000.
Trzaskos, William J.: *See—*
Casey, Donald J.; and Trzaskos, William J., 4,593,130, Cl. 568-427.000.
Tsao, Chan D.: *See—*
Acampora, Anthony; Hluchjy, Michael G.; and Tsao, Chan D., 4,593,282, Cl. 340-825.500.
Tschantz, William H., to Quadracast, Inc. Coal breaker and sorter. 4,592,516, Cl. 241-76.000.
Tsubakimoto Chain Co.: *See—*
Yamamoto, Kenzo, 4,593,238, Cl. 318-587.000.
Yamamoto, Kenzo, 4,593,239, Cl. 318-587.000.
Tsuchida, Naoki, to Yamaha Hatsudoki Kabushiki Kaisha. Valve actuating mechanism for internal combustion engine. 4,592,314, Cl. 123-90.360.
Tsuchimoto, Shuuhei: *See—*
Kadono, Masaru; Nago, Kumio; Tsuchimoto, Shuuhei; and Yoshikawa, Mitsuhiko, 4,592,923, Cl. 427-35.000.
Tsuda, Sounosuke: *See—*
Tanimoto, Takuharu; Tsuda, Sounosuke; and Yamasaki, Mutsuo, 4,592,543, Cl. 271-227.000.

Tsuji, Masao; Mori, Fumio; and Ichihara, Yoshihiro, to Kuraray Co., Ltd. 11-hydroxypregn-4-en-3-one-20-carbaldehyde and a method for its production. 4,592,868, Cl. 260-397.100.
Tsuji, Teruji: *See*—
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.
Tsukakoshi, Hiroshi: *See*—
Suzuki, Toshiyuki; and Tsukakoshi, Hiroshi, 4,592,819, Cl. 204-203.000.
Tubergen, Timothy S.; and Benjamin, Terrell A., to Shipley Company Inc. Process for metallizing plastics. 4,592,929, Cl. 427-98.000.
Tuda, Goro; Kada, Hironosuke; Sekino, Teruyoshi; and Nagahama, Yasuhide, to Kabushiki Kaisha Kobe Seiko Sho. Gravity balancing device for rocking arm. 4,592,697, Cl. 414-719.000.
Tung Ming Electrical Co. Ltd.: *See*—
Tong, George K. K., 4,592,613, Cl. 339-147.00P.
Tunzini-Nessi Entreprises d'Equipments: *See*—
Meunier, Georges, 4,592,151, Cl. 34-168.000.
Turkin, Vladimir Y.: *See*—
Zarogatsky, Leonid P.; Ivanov, Nikolai A.; Korolkov, Mikhail F.; Laubgan, Villi R.; Safronov, Andrei N.; Turkin, Vladimir Y.; and Ivanov, Boris G., 4,592,517, Cl. 241-207.000.
Turturro, Antonio: *See*—
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Ucci, Pompelio A.: *See*—
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Uchida, Kazuko: *See*—
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,592,965, Cl. 428-621.000.
Uchino, Megumi, to Hitachi, Ltd. Data communication system with timed access to link. 4,593,283, Cl. 340-825.070.
Ueda, Kazuhiko: *See*—
Hitomi, Mitsuo; Sasaki, Junzo; and Ueda, Kazuhiko, 4,592,310, Cl. 123-52.00M.
Ueda, Sei; Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Asami, Kazutomo; and Wada, Fumio, to Mitsubishi Denki Kabushiki Kaisha. Lubrication for rotary compressor vane. 4,592,705, Cl. 418-63.000.
Ueda, Tomoyuki; and Ogawa, Hirotoshi, to Asahi Yukisai Kogyo Co. Ltd. Valve assembly. 4,592,534, Cl. 251-266.000.
Uehara, Makoto; Anzai, Satoru; and Suwa, Kyoichi, to Nippon Kogaku K. K. Double-conjugate maintaining optical system. 4,592,625, Cl. 350-415.000.
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Yamamoto, Munemitsu; and Hitotsuya, Ryoichi, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Aqueous sterilizing agent for foods or food processing machines and utensils. 4,592,892, Cl. 422-28.000.
Uhde GmbH: *See*—
Ilgner, Hartmut; Thiagarajan, Natarajan; Heck, Gunter; and Lienerth, Aladar, 4,592,806, Cl. 203-71.000.
Uhlin, Lars: *See*—
Noreus, Sture; Lundberg, Hans; Uhlin, Lars; and Lindquist, Bengt, 4,592,804, Cl. 162-19.000.
ujita, Tsuginobu; and Takahashi, Seiichi, to Kubota, Ltd. Power steering apparatus. 4,592,440, Cl. 180-155.000.
Umezawa, Hamao; Takeuchi, Tomio; Kouno, Kageaki; Ishikura, Tomoyuki; Yoshimoto, Akihiro; Takatsuki, Yukio; and Tobe, Hiroyasu, to Sanraku Incorporated. Process for producing daunomycin. 4,592,999, Cl. 435-78.000.
Unette Corporation: *See*—
Smith, Robert C., 4,592,493, Cl. 222-212.000.
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Abatjoglou, Anthony G.; and Bryant, David R., 4,593,011, Cl. 502-161.000.
Bunning, Donald L.; and Blessing, Michael A., 4,593,127, Cl. 568-454.000.
Chiu, Herman S., 4,592,918, Cl. 426-533.000.
Dombek, Bernard D., 4,592,870, Cl. 260-410.600.
Fuderer, Andrija, 4,592,860, Cl. 252-376.000.
Gioffre, Anthony J.; and Ross, Ronald J., 4,592,855, Cl. 252-89.100.
Keogh, Michael J., 4,593,071, Cl. 525-288.000.
Keogh, Michael J., 4,593,072, Cl. 525-326.500.
Koleske, Joseph V., 4,593,051, Cl. 522-31.000.
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Pahade, Ravindra F.; Saunders, John B.; and Maloney, James J., 4,592,767, Cl. 62-31.000.
Parrish, Lien N., 4,592,882, Cl. 264-66.000.
Qureshi, Shahid P.; and Gardner, Hugh C., 4,593,056, Cl. 523-445.000.
Rifi, Mahmoud R., 4,593,075, Cl. 525-356.000.
Wolstoncroft, Richard L., 4,592,934, Cl. 427-355.000.
Wu, Tai-Teh; Huang, Jamin; and Manning, David T., 4,592,774, Cl. 71-90.000.
Zupancic, Ronald L., 4,592,970, Cl. 429-82.000.
Union Oil Company of California: *See*—
Switzer, Jay A., 4,592,807, Cl. 204-2.100.
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Bekele, Solomon; and Lee, Victor W., 4,592,861, Cl. 252-511.000.
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United Kingdom Atomic Energy Authority: *See*—
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Howard, Frederick W.; and Strong, Keith T., 4,592,581, Cl. 294-2.000.
U.S. Metal Works, Inc.: *See*—
Palmer, Donald C., 4,592,288, Cl. 110-236.000.
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Air Force: *See*—
Lewis, Wallace J., 4,592,922, Cl. 427-34.000.
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Leupold, Herbert A.; Potenziani, Ernest, II; Klimek, Joseph P.; and Tauber, Arthur, 4,592,889, Cl. 419-66.000.
Madderra, Jimmy M.; and Schaeffel, John A., Jr., 4,592,525, Cl. 244-3.280.
McRight, Tulon C., Jr.; Friday, William A.; and Mitchell, Ronald W., 4,593,207, Cl. 307-271.000.
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Panitz, John A., 4,592,894, Cl. 422-69.000.
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Goldwasser, Judah M.; Adolph, Horst G.; and Ebner, Cynthia L., 4,593,110, Cl. 549-347.000.
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U.S. Philips Corporation: *See*—
Blom, Hendrik; Stok, Filippus L.; and Tienkamp, Engbert, 4,593,321, Cl. 358-219.000.
Krol, Thijs; and van den Enden, Adrianus W. M., 4,593,387, Cl. 370-58.000.
Kuppers, Paul D.; Schelhas, Karl H.; van den Brekel, Cornelis H. J.; and Khoe, Giok D., 4,592,924, Cl. 427-45.100.
Nooijen, Fransiscus M. J.; and Bergmans, Christianus H. J., 4,593,346, Cl. 363-21.000.
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Schouhamer Immink, Kornelis A.; and Vries, Lodewijk B., 4,593,395, Cl. 371-40.000.
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United Technologies Corporation: *See*—
Moffatt, E. Marston; and Swarts, Richard E., 4,592,232, Cl. 73-505.000.
Vesce, Richard V.; and Torres, John R., 4,593,213, Cl. 307-564.000.
Unitika Ltd.: *See*—
Murakami, Kunio, 4,592,880, Cl. 264-22.000.
University College London: *See*—
Cousins, Steven J.; Jones, Keith N.; and Ackerley, Kenneth E., 4,592,587, Cl. 297-284.000.
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Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,593,021, Cl. 514-182.000.
University of Minnesota, The Regents of the: *See*—
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Jagger, Janine C.; Pearson, Richard D.; Guyenet, Patrice G.; and Brand, Jessica J., 4,592,744, Cl. 604-192.000.
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Uno, Shinichi; Suzuki, Etsuji; Douji, Ryuhachirou; and Inoue, Mituji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of convergence measurement for a color picture tube and an apparatus therefor. 4,593,309, Cl. 358-10.000.
UNR Lighting: *See*—
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Up-Right, Inc.: *See*—
Ream, Michael D.; and Guignard, Paul C., 4,592,447, Cl. 182-127.000.
Upjohn Company, The: *See*—
Dutton, Fred E.; and Nelson, Stephen J., 4,592,871, Cl. 558-2.000.
Moon, Malcolm W., 4,593,098, Cl. 544-373.000.
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,593,030, Cl. 514-269.000.
Wierenga, Wendell; and Skulnick, Harvey I., 4,593,096, Cl. 544-321.000.
Upsher Laryngoscope Corp., The: *See*—
Upsher, Michael S., 4,592,343, Cl. 128-11.000.
Upsher, Michael S., to Upsher Laryngoscope Corp., The. Laryngoscope. 4,592,343, Cl. 128-11.000.
Usdan, Myron S. Directory interface and dialer. 4,593,157, Cl. 179-90.0BD.
Ushida, Kazuo; Tanaka, Masashi; and Shimizu, Yoshiyuki, to Nippon Kogaku K.K. Objective lens for microscope of low magnification. 4,592,624, Cl. 350-414.000.
Ushiro, Sotaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Disk cache system. 4,593,354, Cl. 364-200.000.

USM Corporation: *See—*
Hirsch, Richard F., 4,592,136, Cl. 29-809.000.
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Morse, Albert I., 4,592,798, Cl. 156-578.000.

Usui, Masahiro; and Higashio, Yasuhiko, to Atlantic Richfield Company. Production of hydrocarbon-soluble salts of molybdenum for epoxidation of olefins. 4,593,012, Cl. 502-167.000.

USV Pharmaceutical Corporation: *See—*
Lavender, Ardis R.; and Vrany, George, 4,592,582, Cl. 294-137.000.

Utsumi, Hiroo: *See—*
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Valeo: *See—*
Cadars, Patrick, 4,592,418, Cl. 165-104.320.

Vallender, Leonard J.: *See—*
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Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of crystalline silicate ZSM-5 with an alkyltropinium compound promoter. 4,592,902, Cl. 423-328.000.

Van Doorne'S Transmissie B.V.: *See—*
Cadee, Theodorus P. M., 4,592,457, Cl. 192-0.076.

Vanago, Joseph. Method for miter jointing frames and apparatus for the implementation thereof. 4,592,401, Cl. 144-346.000.

Vance, Lane D.: *See—*
Anderson, C. Keith; Vieth, George C., Jr.; Vance, Lane D.; and Grant, Darwin D., 4,592,485, Cl. 221-150.0HC.

Vandenbergh, Peter A., to Microlife Technics, Inc. Bacterial method and compositions for isoprenoid degradation. 4,593,003, Cl. 435-172.300.

van den Brekel, Cornelis H. J.: *See—*
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van den Enden, Adrianus W. M.: *See—*
Krol, Thijs; and van den Enden, Adrianus W. M., 4,593,387, Cl. 370-58.000.

van der Mei, Henk, deceased: *See—*
Behr, Norbert; von Ettingshausen, Othmar; Wust, Reinhold; and van der Mei, Henk, deceased, 4,592,911, Cl. 424-195.100.

Vandervelden, Keith: *See—*
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Vandeweghe, Michel; and Derde, Jan F., to N.V. Weefautomaten Picanol. Shot seeking mechanism for weaving looms. 4,592,392, Cl. 139-1.00E.

Van Gemert, Barry, to PPG Industries, Inc. Sulfamoyl urea derivatives. 4,592,776, Cl. 71-93.000.

van Herpen, Frederik C., to Alprokon Promotie en Ontwikkeling B.V. Roof edging system. 4,592,176, Cl. 52-96.000.

Vanistendael, David M., to Davan Industries. Wear pads. 4,592,682, Cl. 408-241.00R.

Van Ostrand, William F.; and Sylvia, Jeffrey M., to Laboratory Equipment Corp. Motor vehicle performance monitoring system. 4,593,357, Cl. 364-424.000.

van Rijekevorsel, Rainer: *See—*
Poppe, Werner; van Rijekevorsel, Rainer; Ruppender, Uwe; and Macho, Heinz, 4,592,893, Cl. 422-56.000.

Varga, Sandor L.: *See—*
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Varian Associates, Inc.: *See—*
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Hill, Howard D., 4,593,246, Cl. 324-307.000.

Vaughan, Ronald J., deceased; and by Bank of America NT&SA, administrator, to Chevron Research Company. Electrochemical synthesis of humic acid and other partially oxidized carbonaceous materials. 4,592,814, Cl. 204-78.000.

Vaughn, Buddy W. Power handle for electronic flash unit and remote shutter release device. 4,592,635, Cl. 354-133.000.

Vaupel, Knut: *See—*
Ludwig, Gerhard; Simon, Jozsef; Zorkendorfer, Eckhard; Gappa, Gunther; Vaupel, Knut; and Klein, Jurgen, 4,592,837, Cl. 210-189.000.

Vaw-Folein-Verarbeitung GmbH: *See—*
Leonhardt, Heinz; and Rhein, Otto H., 4,592,477, Cl. 215-334.000.

VDO Adolf Schindling AG: *See—*
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VEB Berlin-Chemie: *See—*
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.

VEB Kombinat Fortschritt-Landmaschinen: *See—*
John, Gunter; Kretschmer, Karl-Heinz; Schumacher, Horst; and Rollich, Jurgen, 4,592,514, Cl. 241-55.000.

VEB Stahl- und Walzwerk "Wilhelm Florin": *See—*
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Vegoe, Brett R.: *See—*
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Veltronic S.p.A.: *See—*
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Vener, Alvin S. Smoke and fire protection system for elevators. 4,592,270, Cl. 98-39.100.

Venuti, Michael C.; and Bruno, John J., to Syntex (U.S.A.) Inc. Novel ω-(N-imidazolyl)alkyl ethers of 1,2,3,5-tetrahydroimidazo[2,1-b]quinazolin-2-ones. 4,593,029, Cl. 514-267.000.

Venuti, Michael C.: *See—*
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,593,120, Cl. 560-107.000.

Vereczkey, Laszlo : *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Vering, Antonius: *See—*
Durr, Manfred; Unland, Georg; Wurr, Jurgen; and Vering, Antonius, 4,592,724, Cl. 432-78.000.

Vermot-Gauchy, Robert: *See—*
Desblache, Andre ; Galand, Claude; and Vermot-Gauchy, Robert, 4,593,161, Cl. 179-170.200.

Verton, Jose , to Champion Spark Plug Europe S.A. Wiper assembly for motor vehicles. 4,592,110, Cl. 15-250.350.

Vesce, Richard V.; and Torres, John R., to United Technologies Corporation. Current-limited MOSFET switch. 4,593,213, Cl. 307-564.000.

Vescia, Michele: *See—*
Fikentscher, Rolf; Mertens, Heinrich; Reincke, Klaus; and Vescia, Michele, 4,592,758, Cl. 8-567.000.

Vesperman, William C.: *See—*
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,592,955, Cl. 428-389.000.

Vest, Glenn E., to General Electric Company. Speed limiting means for variable-speed prime mover. 4,592,323, Cl. 123-362.000.

Vetter, Jurgen: *See—*
Forster, Helmut; Heinzelmann, Karl-Georg; Siebold, Horst; and Vetter, Jurgen, 4,593,261, Cl. 335-300.000.

Vezzani, Savino: *See—*
Guglielmi, Mauro; Pighetti, Antonio; Vezzani, Savino; and Acerbi, Sergio, 4,592,533, Cl. 251-30.010.

Vg Instruments Group Limited: *See—*
Yates, Kenneth, 4,593,196, Cl. 250-305.000.

Victor Company of Japan, Ltd.: *See—*
Hirota, Akira; and Nagaoka, Yoshimichi, 4,593,327, Cl. 358-330.000.
Nakamura, Mutsuaki; Namikawa, Kazuhira; Hamaguchi, Toshiaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,592,862, Cl. 252-511.000.

Vidler, Albert R.: *See—*
Bromley, Jonathan S. E.; Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,593,173, Cl. 219-124.340.

Viertl, John R. M.; and Auger, Mederic E., to General Electric Company. Eddy current method for detecting a flaw in semi-conductive material. 4,593,245, Cl. 324-238.000.

Vieth, George C., Jr.: *See—*
Anderson, C. Keith; Vieth, George C., Jr.; Vance, Lane D.; and Grant, Darwin D., 4,592,485, Cl. 221-150.0HC.

Vincent, Michel J. Medical apparatus designed for the aspiration of phneumothorax. 4,592,741, Cl. 604-35.000.

Vinylex Corporation: *See—*
Simon, Melvin L., 4,592,127, Cl. 29-451.000.

Viola, Michael S., to Polaroid Corporation. Ink jet recording sheet. 4,592,951, Cl. 428-323.000.

Viret, Jacques. 5-acetyloxy-L-tryptophane and preparation method thereof. 4,593,107, Cl. 548-496.000.

Vista Chemical Company: *See—*
Yang, Kang, 4,593,142, Cl. 568-618.000.

Vittay, Pal: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,593,047, Cl. 514-726.000.

Vogdes, Christine E.; and Andrews, Brackin L., to Raychem Corporation. Stabilized poly(aryl ether ketone) compositions. 4,593,061, Cl. 524-417.000.

Vogeley, Otto A.: *See—*
Rex, Jorn; and Vogeley, Otto A., 4,592,745, Cl. 604-211.000.

Voigt, Walter: *See—*
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,593,021, Cl. 514-182.000.

Volk, Larry N. System for vending program cartridges which have circuitry for inhibiting program usage after preset time interval expires. 4,593,376, Cl. 364-900.000.

Vollmuth, Lawrence P.; and Porthan, Robert J., to Allied Tube & Conduit Corporation. Conduit coupling assembly and method of use. 4,592,574, Cl. 285-31.000.

von der Eltz, Hans-Ulrich, to Hoechst Aktiengesellschaft. Process and apparatus for the continuous treatment of textile material in rope form. 4,592,107, Cl. 8-149.100.

von Ettingshausen, Othmar: *See—*
Behr, Norbert; von Ettingshausen, Othmar; Wust, Reinhold; and van der Mei, Henk, deceased, 4,592,911, Cl. 424-195.100.

Vortex Research Corp.: *See—*
Jost, Leonora, 4,592,748, Cl. 604-279.000.

Vorwerk & Sohn GmbH & Co. KG: *See—*
Stein, Hermann; and Piepenbrink, Ulrich, 4,592,403, Cl. 152-158.000.

Vrany, George: *See—*
Lavender, Ardis R.; and Vrany, George, 4,592,582, Cl. 294-137.000.

Vries, Lodewijk B.: *See—*
Schouhamer Immink, Kornelis A.; and Vries, Lodewijk B., 4,593,395, Cl. 371-40.000.

Wachtel, Helmut: *See—*
Kehr, Wolfgang; Schroder, Gertrud; Stock, Gunter; and Wachtel, Helmut, 4,593,032, Cl. 514-288.000.

Wada, Fumio: *See—*
Ueda, Sei; Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Asami, Kazutomo; and Wada, Fumio, 4,592,705, Cl. 418-63.000.

Wada, Yoshinori: *See—*
Kanda, Hajime; Murase, Katsuo; Hishida, Hiroshi; Adachi, Eiichi; Wada, Yoshinori; and Koseki, Yuji, 4,593,323, Cl. 358-256.000.

Wagner, Alfred; and Ames, Adolf, to Swiss Aluminium Ltd. Process and device for extruding a hollow section. 4,592,224, Cl. 72-264.000.

Wahl Clipper Corporation: *See—*
Wahl, Gregory S., 4,592,345, Cl. 128-33.000.

Wahl, Gregory S., to Wahl Clipper Corporation. Back massager structure. 4,592,345, Cl. 128-33.000.

Wajaroff, Theodor; and Gallist, Helga, to Wella Aktiengesellschaft. Protective cream for the scalp and method of straightening hair. 4,592,908, Cl. 424-71.000.

Wako Pure Chemical Industries, Ltd.: *See—*
Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,592,996, Cl. 435-11.000.

Waldes Truarc, Inc.: *See—*
Sikula, John, 4,592,122, Cl. 29-229.000.

Waldmann, Helmut: *See—*
Stammann, Gunter; Grolig, Johann; Becker, Robert; and Waldmann, Helmut, 4,593,116, Cl. 560-24.000.

Waldorf, Virgil J.: *See—*
Robertson, Joeab A.; Waldorf, Virgil J.; Wilkes, Robert D.; and Pucket, Joe D., 4,592,100, Cl. 4-492.000.

Walker, Clarence L.: *See—*
Burkholder, Richard A.; Gilson, Richard W.; and Walker, Clarence L., 4,592,746, Cl. 604-220.000.

Walker, James: *See—*
Shapiro, Stephen; Hyams, Bernard H.; Parker, Sherwood; and Walker, James, 4,593,381, Cl. 365-45.000.

Wallace, Robert S., to Wallace, Robert S.; and Bauman, Jack, a part interest. Cushioning container. 4,592,468, Cl. 206-387.000.

Wallis, Frederick A. Ratchet wrench. 4,592,254, Cl. 81-57.390.

Walsh, Fraser M., to Tracer Technologies, Inc. Metal halogen electrochemical cell. 4,592,971, Cl. 429-105.000.

Walter, Frank J.: *See—*
Lynch, Steven K.; Narhi, Erland D.; and Walter, Frank J., 4,592,185, Cl. 52-543.000.

Walter, Wolfgang: *See—*
Spielmann, Norbert; Gussbacher, Udo; Walter, Wolfgang; Bauer, Hermann; and Porzel, Rainer, 4,592,438, Cl. 180-89.100.

Walters, Peter J.; and Weaver, William N., to Illinois Tool Works Inc. Container carrier and package. 4,592,466, Cl. 206-150.000.

Walton, Frank T., to Wellman Thermal Systems Corporation. Glow plug. 4,592,134, Cl. 29-611.000.

Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., to Abbott Laboratories. Fluorescent polarization immunoassay utilizing substituted triazinylaminofluorescein aminoglycosides. 4,593,089, Cl. 536-13.600.

Waring, James P.; and Smith, Robert D., to Scandpower, Inc. Apparatus for and method of determining the liquid coolant level in a nuclear reactor. 4,592,230, Cl. 73-295.000.

Warner-Lambert Company: *See—*
Bristol, James A.; Moos, Walter; and Trivedi, Bharat K., 4,593,019, Cl. 514-46.000.

Warner-Lambert K.K.: *See—*
Kawasaki, Tetsuji; Miyoshi, Noriomi; and Tachibana, Yukimasa, 4,593,190, Cl. 250-223.00R.

Warnke, Wayne L.: *See—*
Marier, Gregory J.; and Warnke, Wayne L., 4,592,441, Cl. 180-217.000.

Warnock, Rudolph M.; Alford, Thomas G., Sr.; and Alford, Thomas G., Jr. ATV/ATC tow bar. 4,592,564, Cl. 280-402.000.

Warren, Henry R., to RCA Corporation. Tape threading arrangement for 360 degree wrap tape recorder. 4,593,330, Cl. 360-85.000.

Washer, Stone P., to Phillips Petroleum Company. Desiccant bed on hydrocarbon charged to and removed from underground (salt) cavern. 4,592,677, Cl. 405-59.000.

Watanabe, Takashi: *See—*
Okamoto, Yasuhiro; Watanabe, Takashi; and Kubo, Motonobu, 4,593,121, Cl. 560-144.000.

Water Marketers, Inc.: *See—*
Winer, Steven; and Evans, William J., 4,592,909, Cl. 424-127.000.

Water Services of America, Inc.: *See—*
Baron, Walter J., 4,592,417, Cl. 165-95.000.

Waters, William C., IV; and Wilmer, Charles I. Aerosol inhaler. 4,592,348, Cl. 128-200.230.

Watson, David J.: *See—*
McWhirter, John G.; Pike, Edward R.; and Watson, David J., 4,593,378, Cl. 364-900.000.

Watts, Glen A. Roll-over variable width plow. 4,592,429, Cl. 172-212.000.

Weaver, William N.: *See—*
Walters, Peter J.; and Weaver, William N., 4,592,466, Cl. 206-150.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Rummel, Wolfram, 4,592,207, Cl. 62-244.000.

Weber, Manfred; and Dedegil, Mehmet, to NUKEM GmbH. Rotational viscosimeter. 4,592,226, Cl. 73-59.000.

Webster Spring Co. Inc.: *See—*
Hagemeister, Robert C., 4,592,106, Cl. 5-245.000.

Wehrmeister, Herbert L.: *See—*
Lu, Jing-jong; and Wehrmeister, Herbert L., 4,593,024, Cl. 514-234.000.

Weibel, Hans: *See—*
Grieder, Max; Evans, Albert D.; and Weibel, Hans, 4,592,835, Cl. 210-107.000.

Weidel, Edgar, to Licentia Patent-Verwaltungs GmbH. Optical coupling device. 4,592,619, Cl. 350-96.110.

Weigele, Hans: *See—*
Lehmann, Ulrich; and Weigele, Hans, 4,592,249, Cl. 74-473.00R.

Weigert, Frank J., to Du Pont de Nemours, E. I., and Company. Process for preparing a mixture of methyl- or ethyl-substituted primary anilines. 4,593,124, Cl. 564-409.000.

Weimann, Norbert: *See—*
Dahm, Manfred; Weimann, Norbert; Nehen, Ulrich; Muller, Hanns P.; Jabs, Gert; Awater, Albert; and Barnes, James M., 4,592,957, Cl. 428-402.210.

Weinstock, Joseph: *See—*
Stringer, Orum D.; Weinstock, Joseph; and Wilson, James W., 4,593,106, Cl. 548-485.000.

Weiss Etikettiertechnik GmbH+Co. KG: *See—*
Schlacht, Ernst, 4,592,796, Cl. 156-450.000.

Weiss, Paul: *See—*
Kuster, Manfred; and Weiss, Paul, 4,592,602, Cl. 312-223.000.

Weiss, Urs: *See—*
Reiner, Roland; and Weiss, Urs, 4,593,093, Cl. 544-22.000.

Weissenberger, Helmuth; and Werner, Karl-Heinz, to Fichtel & Sachs AG. Elastic torque transmission unit. 4,592,459, Cl. 192-106.200.

Wella Aktiengesellschaft: *See—*
Sigmund, Ludwig; Steigerwald, Franz; and Zulauf, Karlheinz, 4,592,376, Cl. 132-112.000.
Wajaroff, Theodor; and Gallist, Helga, 4,592,908, Cl. 424-71.000.

Wellman Thermal Systems Corporation: *See—*
Walton, Frank T., 4,592,134, Cl. 29-611.000.

Wells, James E., III, to Elkem Metals Company. Apparatus for producing predominately iron alloy containing magnesium. 4,592,538, Cl. 266-216.000.

Wentzell, Timothy H., to Combustion Engineering, Inc. Tube sleeve. 4,592,391, Cl. 138-98.000.

Werner, Karl-Heinz: *See—*
Weissenberger, Helmuth; and Werner, Karl-Heinz, 4,592,459, Cl. 192-106.200.

Werner Metal Industries, Inc.: *See—*
Werner, William J., 4,592,175, Cl. 52-79.900.

Werner, William J., to Werner Metal Industries, Inc. Modular habitation structure. 4,592,175, Cl. 52-79.900.

Westinghouse Electric Corp.: *See—*
Ghrist, William D., III, 4,593,364, Cl. 364-494.000.
Grimes, Frank H.; and Sinha, Ram R. P., 4,592,133, Cl. 29-605.000.
Mathews, Bruce D.; and Mims, James H., 4,593,286, Cl. 343-7.00A.

Westner, Andrew A.: *See—*
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,593,141, Cl. 568-454.000.

Westplate, Wayne J. Therapeutic device. 4,592,358, Cl. 128-402.000.

Weuffen, Wolfgang: *See—*
Adam, Lothar; Albrecht, Ursula; Burth, Ulrich; Kramer, Axel; Luck, Sieghard; Muller, Rainer; Neeb, Lothar; Rattba, Hubert; and Weuffen, Wolfgang, 4,593,040, Cl. 514-395.000.

Wheable, Desmond, to Transamerica Delaval Inc. Temperature-controlled systems for non-thermal parameter measurements. 4,592,665, Cl. 374-143.000.

Wheater, Robin A.: *See—*
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,592,944, Cl. 428-195.000.

Wheeler, Edward L.: *See—*
Gencarelli, Richard A.; and Wheeler, Edward L., 4,593,105, Cl. 548-329.000.

White, Harry B. Portable telescoping tree stand. 4,592,446, Cl. 182-93.000.

White, Hollis N., Jr. Hone for gerotor stators, and honing method. 4,592,173, Cl. 51-330.000.

White, Pierce H., Jr. Arm rest device. 4,592,584, Cl. 296-153.000.

White, Robert, to Burr-Brown Corporation. Successive approximation analog to digital converter. 4,593,270, Cl. 340-347.0AD.

White, William P.: *See—*
Robbins, Eric J.; Clayton, Alan M.; White, William P.; and Leckenby, Robert E., 4,592,662, Cl. 374-57.000.

Whitehead, Edwin N., to Whitehead, N. Peter. Identification card. 4,592,976, Cl. 430-10.000.

Whitehead, N. Peter: *See—*
Whitehead, Edwin N., 4,592,976, Cl. 430-10.000.

Whitehead, Patrick B. G.: *See—*
Golob, Theodore B.; Gilles, Wim; Jasinski, Stan K.; and Whitehead, Patrick B. G., 4,592,398, Cl. 144-3.00D.

Whitney, Everest G. Plant protective apparatus. 4,592,428, Cl. 172-81.000.

Whittam, Thomas V.: *See—*
Casci, John L.; Lowe, Barrie M.; and Whittam, Thomas V., 4,593,138, Cl. 585-481.000.

Wiebus, Ernst: *See—*
Cornils, Boy; Konkol, Werner; Bach, Hanswilhelm; Dambkes, Georg; Gick, Wilhelm; Greb, Wolfgang; Wiebus, Ernst; and Bahrmann, Helmut, 4,593,126, Cl. 568-454.000.

Wierenga, Wendell; and Skulnick, Harvey I., to Upjohn Company, The. Novel compounds and process for treating hypertension. 4,593,096, Cl. 544-321.000.

Wierenga, Wendell: *See—*
Skulnick, Harvey I.; Smith, Herman W.; Smith, Robert J.; and Wierenga, Wendell, 4,593,030, Cl. 514-269.000.

Wiers, John W., to Rockwell International Corporation. Housing for seat adjuster locking mechanism. 4,592,591, Cl. 297-375.000.

Wieser, Tiberius: *See—*
Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, 4,592,597, Cl. 303-15.000.

Wiggins, Robert B.: *See—*
EerNisse, Errol P.; and Wiggins, Robert B., 4,592,663, Cl. 374-117.000.

Wignot, Leroy S., to RCA Corporation. Multiband local oscillator. 4,593,257, Cl. 331-117.00R.

Wilbur, Leonard P., Jr., to RCA Corporation. Paste material dispensing device. 4,592,303, Cl. 118-409.000.

Wilcox, Thomas J., to Indiana Brass, Inc. Connector assembly for swivel type faucet spout. 4,592,388, Cl. 137-615.000.

Wiley, David: *See—*
Taylor, Joseph D. F.; and Wiley, David, 4,593,233, Cl. 315-307.000.

Wilhelm Fette GmbH: *See—*
Krueger, Eberhart; and Kunsken, Helmut, 4,592,221, Cl. 72-84.000.

Wilhelms, Otto-Henning; Stahl, Peter; and Wunderwald, Peter, to Boehringer Mannheim GmbH. Process for the detection of the presence of an allergy and for the specific detection of the allergen responsible for the allergy. 4,592,997, Cl. 435-23.000.

Wilke, Rudolf. Piece of furniture, particularly cabinet. 4,592,604, Cl. 312-245.000.

Wilkes, Robert D.: *See—*
Robertson, Joeab A.; Waldorf, Virgil J.; Wilkes, Robert D.; and Pucket, Joe D., 4,592,100, Cl. 4-492.000.

Willaschek, Horst, to M.A.N. Maschinenfabrik Augsburg-Nurnberg. Device for arresting a steel making converter. 4,592,539, Cl. 266-246.000.

Willcox, Frederick P., to IBM Business Machines Corporation. Rotary stepping motor having improved construction. 4,593,216, Cl. 310-49.000.

William H. Rorer, Inc.: *See—*
Campbell, Henry F., 4,593,028, Cl. 514-256.000.

Williams, Gerald J. Internal combustion engine. 4,592,309, Cl. 123-39.000.

Williams International Corporation: *See—*
Egan, Michael J.; and Quill, Gary J., 4,592,120, Cl. 29-156.80R.

Williams, Joseph L.; Sansing, John W.; Hayes, Michael E.; and Deal, James F., to Petroleum Fermentations N.V. Process for cleaning an oil contaminated vessel. 4,592,786, Cl. 134-22.180.

Williams, Russell R.; and Lestage, Clyde W. Automatically operated boring head. 4,592,432, Cl. 175-26.000.

Willis, Donald H.; and Christopher, Todd J., to RCA Corporation. Progressive scan television receiver for non-standard signals. 4,593,315, Cl. 358-140.000.

Wilmer, Charles I.: *See—*
Waters, William C., IV; and Wilmer, Charles I., 4,592,348, Cl. 128-200.230.

Wilson, Barri L.; Fasick, Ernest J.; King, James H.; and Leitzman, Noel E., to International Harvester Company. Control system for a vehicle with two speed rear axle and single speed front axle drive. 4,592,442, Cl. 180-247.000.

Wilson, Bruce L., to Dobbie Instruments (Australia) Pty. Ltd. Heat stress monitor. 4,592,661, Cl. 374-10.000.

Wilson, Donnie S., to Mebane Packaging Corporation. Telescoping carton and insect trap. 4,592,163, Cl. 43-122.000.

Wilson, James W.: *See—*
Stringer, Orum D.; Weinstock, Joseph; and Wilson, James W., 4,593,106, Cl. 548-485.000.

Wilson, Marlin G.: *See—*
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Wilson, R. Woodrow, Jr.; and Thomas, Dustin H., to Ethyl Corporation. Polyphosphazene process. 4,593,129, Cl. 568-716.000.

Wilson, Richard S.: *See—*
Dennesen, Joseph C.; and Wilson, Richard S., 4,592,277, Cl. 101-38.00R.

Winckler, Wilhelm: *See—*
Bohn, Hans; and Winckler, Wilhelm, 4,592,863, Cl. 530-350.000.

Winer, Steven; and Evans, William J., to Water Marketers, Inc. Water based drink for people engaged in athletic or other strenuous activity. 4,592,909, Cl. 424-127.000.

Winkle, Mark R.: *See—*
Emmons, William D.; and Winkle, Mark R., 4,592,816, Cl. 204-180.600.

Winklemann, Erhardt; Durckheimer, Walter; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. 3-aryl-7-chloro-3,4-dihydroacridine-1,9(2H,10H)-dione 1-oximes and 1-hydrazone derivatives, their salts, a process for their preparation, agents containing them and their use. 4,593,027, Cl. 514-253.000.

Winter, Alfred: *See—*
Novak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Taucher, Robert, 4,592,569, Cl. 280-624.000.

Winters, William C., to Sandoz, Inc. Souffle compositions. 4,592,919, Cl. 426-568.000.

Wisbey, Robert W.; and Droho, Joseph S., to Advance Transformer Co. Three-way fluorescent lamp device. 4,593,231, Cl. 315-100.000.

Withers, Howard P., to Atlantic Richfield Company. Methane conversion. 4,593,139, Cl. 585-500.000.

Witkin, Roy T.: *See—*
Simon, Gilbert I.; and Witkin, Roy T., 4,592,487, Cl. 222-94.000.
Simon, Gilbert I.; and Witkin, Roy T., 4,592,488, Cl. 222-94.000.
Simon, Gilbert I.; and Witkin, Roy T., 4,592,489, Cl. 222-94.000.

Woffendin, Arnold, to Silentnight Holdings PLC. Wire forming apparatus. 4,592,223, Cl. 72-142.000.

Wojtowicz, Edward A., to System Development Corporation. Collapsible antenna assembly. 4,593,290, Cl. 343-900.000.

Wolcott, Bernard F.: *See—*
Scales, John M.; and Wolcott, Bernard F., 4,592,675, Cl. 405-19.000.

Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, to Chimicasa GmbH. Preparation for deactivating viruses and process for producing same. 4,592,910, Cl. 424-195.100.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Cap or bell spinning machine. 4,592,196, Cl. 57-74.000.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Ring-spinning or ring-twisting machine with restart control. 4,592,197, Cl. 57-277.000.

Wolfe, Robert M.: *See—*
Sagedahl, Steven M.; German, Jeffry W.; and Wolfe, Robert M., 4,592,545, Cl. 272-125.000.

Wolstoncroft, Richard L., to Union Carbide Corporation. Method of preparing and packaging automobile wax. 4,592,934, Cl. 427-355.000.

Wong, Ching-Ping, to AT&T Technologies, Inc. Silicone encapsulated devices. 4,592,959, Cl. 428-450.000.

Wood, R. Andrew: *See—*
Hager, Robert J.; and Wood, R. Andrew, 4,592,304, Cl. 118-415.000.

Wortel, Theodorus M., to Exxon Research & Engineering Co. Zeolite L. 4,593,133, Cl. 585-415.000.

Wright, Robert L.; and Zeuschel, Donald W., to Brown Group, Inc. Unlasted shoe. 4,592,152, Cl. 36-11.500.

Wright, Terry L., to Merrell Dow Pharmaceuticals Inc. (Tetrazolyl) thienopyridinones. 4,593,099, Cl. 546-114.000.

Wrobel, Albert A., to Brant, Benjamin, a part interest. Motor vehicle theft deterrent device. 4,592,317, Cl. 123-198.00B.

Wu, Kuo-shen. Automatic key cutting machine. 4,592,683, Cl. 409-83.000.

Wu, Tai-Teh; Huang, Jamin; and Manning, David T., to Union Carbide Corporation. Herbicidal alpha heterocyclic carbinol carbamates, ureas and N-alpha-substituted acetylcarbamates. 4,592,774, Cl. 71-90.000.

Wubben, Carl A.: *See—*
Holm, David R.; and Wubben, Carl A., 4,592,437, Cl. 180-68.600.

Wunderwald, Peter: *See—*
Wilhelms, Otto-Henning; Stahl, Peter; and Wunderwald, Peter, 4,592,997, Cl. 435-23.000.

Wurr, Jurgen: *See—*
Durr, Manfred; Unland, Georg; Wurr, Jurgen; and Vering, Antonius, 4,592,724, Cl. 432-78.000.

Wurzburg, Henry; and Kelley, Stephen H. Simultaneous voice and asynchronous data telephone. 4,593,389, Cl. 370-110.100.

Wurzer, Bruno: *See—*
Eicken, Karl; Rohr, Wolfgang; Zeeh, Bernd; and Wurzer, Bruno, 4,593,104, Cl. 548-262.000.

Wust, Reinhold: *See—*
Behr, Norbert; von Ettingshausen, Othmar; Wust, Reinhold; and van der Mei, Henk, deceased, 4,592,911, Cl. 424-195.100.

Xerox Corporation: *See—*
Kadedodi, Narayan K.; Sheu, Shey-Ping L.; and Ibrahim, Abd-El-Fattah A., 4,593,319, Cl. 358-213.000.
Malhotra, Shadi L., 4,592,954, Cl. 428-335.000.
Smith, Thomas W.; Teegarden, David M.; McGrane, Kathleen M.; and Luca, David J., 4,592,989, Cl. 430-110.000.

Yagami, Kouichi; and Matsuzaki, Kiyoto, to Nissan Motor Co., Ltd. Automobile roof structure. 4,592,586, Cl. 296-218.000.

Yamada, Okimasa, to Nippon Mektron Ltd. Process for treating molded, porous carbon article. 4,592,883, Cl. 264-82.000.

Yamada, Osamu: *See—*
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,593,145, Cl. 585-607.000.

Yamada, Ryuichi; Hirokawa, Toshio; and Goto, Toshihiro, to Toyoda Koki Kabushiki Kaisha. Rotary valve. 4,592,389, Cl. 137-625.220.

Yamada, Toshiaki: *See—*
Kamagata, Kazuo; Yamada, Toshiaki; Kawata, Shunichi; and Mizui, Takashi, 4,593,069, Cl. 525-113.000.

Yamada, Yusuke: *See—*
Takeda, Koji; Sugimoto, Takeshi; and Yamada, Yusuke, 4,593,338, Cl. 361-18.000.

Yamaguchi, Terumoto; and Terashima, Tuneo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Full automatic die casting machine. 4,592,407, Cl. 164-265.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Makino, Sakae, 4,592,311, Cl. 123-73.00A.
Marier, Gregory J.; and Warnke, Wayne L., 4,592,441, Cl. 180-217.000.
Suzuki, Toshiyuki; and Tsukakoshi, Hiroshi, 4,592,819, Cl. 204-203.000.
Tsuchida, Naoki, 4,592,314, Cl. 123-90.360.

Yamamoto, Akira: *See—*
Takamizawa, Minoru; Ishihara, Toshinobu; and Yamamoto, Akira, 4,593,112, Cl. 556-480.000.
Yamamoto, Kazuo: *See—*
Higashiguchi, Teruaki; Miyakawa, Nobuhiro; Yano, Koji; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,592,643, Cl. 355-3.00R.
Yamamoto, Kenzo, to Tsubakimoto Chain Co. Method and apparatus for controlling travel of an automatic guided vehicle. 4,593,238, Cl. 318-587.000.
Yamamoto, Kenzo, to Tsubakimoto Chain Co. Method and apparatus for controlling travel of an automatic guided vehicle. 4,593,239, Cl. 318-587.000.
Yamamoto, Munemitsu: *See—*
Ueno, Ryuzo; Matsuda, Toshio; Kanayama, Tatsuo; Yamamoto, Munemitsu; and Hitotsuya, Ryoichi, 4,592,892, Cl. 422-28.000.
Yamamoto, Suguru; Sasa, Kazuaki; and Sugimoto, Toshihiko, to Nitto Electric Industrial Co., Ltd. Polarizing plate. 4,592,623, Cl. 350-397.000.
Yamamoto, Takashi: *See—*
Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Yamamoto, Takashi, 4,592,633, Cl. 354-76.000.
Yamanishi, Kazuhiko; and Hanada, Toshiro, to Wako Pure Chemical Industries, Ltd. Process for determining reduced form coenzymes. 4,592,996, Cl. 435-11.000.
Yamaoka, Masayoshi: *See—*
Miyake, Akio; and Yamaoka, Masayoshi, 4,593,115, Cl. 560-1.000.
Yamasaki, Masafumi, to Olympus Optical Company, Ltd. Emission controller for electronic flash associated with an electronic camera. 4,593,312, Cl. 358-909.000.
Yamasaki, Mutsuo: *See—*
Tanimoto, Takuharu; Tsuda, Sounosuke; and Yamasaki, Mutsuo, 4,592,543, Cl. 271-227.000.
Yamauchi, Yutaka: *See—*
Egusa, Tomoyoshi; and Yamauchi, Yutaka, 4,592,172, Cl. 51-291.000.
Yamazaki, Kisuke; Otsubo, Michio; and Okuma, Keiko, to Mitsubishi Denki Kabushiki Kaisha. Room-warming/cooling and hot-water supplying heat-pump apparatus. 4,592,206, Cl. 62-160.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,593,151, Cl. 136-244.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,593,152, Cl. 136-246.000.
Yanagi, Michio, to Canon Kabushiki Kaisha. Magnetic head. 4,593,333, Cl. 360-125.000.
Yanagiuchi, Shigenobu: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,593,356, Cl. 364-419.000.
Yang, David C., to Michigan Technological University, Board of Control of. Column froth flotation. 4,592,834, Cl. 209-166.000.
Yang, Jerry S. C. Programmable apparatus for controlling illuminating lamps. 4,593,234, Cl. 315-362.000.
Yang, Kang, to Vista Chemical Company. Methods of alkoxylation. 4,593,142, Cl. 568-618.000.
Yang, Tai-Her. Remote control system for a musical instrument or instruments. 4,592,262, Cl. 84-115.000.
Yang, Yung-hsiung: *See—*
Tominaga, Michiaki; Ogawa, Hidenori; Fujioka, Takafumi; Yang, Yung-hsiung; and Nakagawa, Kazuyuki, 4,593,035, Cl. 514-312.000.
Yaniv, Zvi; and Johnson, Robert R., to Energy Conversion Devices, Inc. Optical-to-optical image transducer capable of accepting X-radiation. 4,593,199, Cl. 250-484.100.
Yano, Koji: *See—*
Higashiguchi, Teruaki; Miyakawa, Nobuhiro; Yano, Koji; Yamamoto, Kazuo; and Kawakami, Yoshinobu, 4,592,643, Cl. 355-3.00R.
Yasada, Seikuro, to Japan Crown Cork Co., Ltd. Combination of a container and a closure. 4,592,476, Cl. 215-252.000.
Yasumi, Hirotsune: *See—*
Motoyama, Shimesu; Sakashita, Shizuka; Myo, Nagayoshi; Yasumi, Hirotsune; and Ogishima, Hiroaki, 4,592,302, Cl. 118-303.000.
Yates, Kenneth, to Vg Instruments Group Limited. Charged particle energy spectrometer. 4,593,196, Cl. 250-305.000.
Yeda Research and Development Co., Ltd.: *See—*
Fraenkel, Dan; Levy, Moshe; and Cherniavsky, Margaret, 4,593,137, Cl. 585-467.000.
Yeh, An-I: *See—*
Berg, Lloyd; and Yeh, An-I, 4,592,805, Cl. 203-51.000.
Yen, Mei-Rong: *See—*
Yu, Terry T.; and Yen, Mei-Rong, 4,592,867, Cl. 260-351.100.
Yokoe, Nobuo: *See—*
Okawa, Takashi; and Yokoe, Nobuo, 4,593,008, Cl. 501-135.000.
Yokogawa, Kanae: *See—*
Hayano, Seiki; Yokogawa, Kanae; and Kurooka, Shigeru, 4,592,995, Cl. 435-7.000.
Yokota, Hideo: *See—*
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,592,636, Cl. 354-225.000.
Yokoya, Yuji; Buma, Shuuichi; and Araki, Hitoshi, to Toyota Jidosha Kabushiki Kaisha. Damping capacity adjusting mechanism for an air suspension. 4,592,540, Cl. 267-8.00R.
Yonezawa, Masayuki, to Newly Weds Foods, Inc. Apparatus for making bread. 4,592,273, Cl. 99-358.000.
Yoshida, Jiro: *See—*
Kurata, Mamoru; and Yoshida, Jiro, 4,593,305, Cl. 357-34.000.
Yoshida Kogyo K. K.: *See—*
Kando, Akiyoshi, 4,592,135, Cl. 29-766.000.
Yoshida, Kunio: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,593,356, Cl. 364-419.000.
Yoshida, Ryo: *See—*
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,593,094, Cl. 544-224.000.
Yoshida, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Hot-water storage type hot-water supply apparatus operating under a natural circulation principle. 4,592,504, Cl. 237-19.000.
Yoshida, Tetsuo; Kokubo, Tadayoshi; Adachi, Keiichi; Ikeda, Tadashi; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Silver halide photographic printing paper. 4,592,991, Cl. 430-139.000.
Yoshihara, Masahiro: *See—*
Takamoto, Tsutomu; Ohhashi, Yasutake; Nishimura, Hisao; Hirata, Yutaka; Okazaki, Takashi; and Yoshihara, Masahiro, 4,592,410, Cl. 164-453.000.
Yoshikawa, Mitsuhiko: *See—*
Kadono, Masaru; Nago, Kumio; Tsuchimoto, Shuuhei; and Yoshikawa, Mitsuhiko, 4,592,923, Cl. 427-35.000.
Yoshimoto, Akihiro: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Kouno, Kageaki; Ishikura, Tomoyuki; Yoshimoto, Akihiro; Takatsuki, Yukio; and Tobe, Hiroyasu, 4,592,999, Cl. 435-78.000.
Yoshinari, Tsuneo: *See—*
Hara, Shinichi; Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mistuo; Mitsuoka, Katsuya; Morijiri, Makoto; Hanazono, Masanobu; and Kobayashi, Tetsuo, 4,592,801, Cl. 156-643.000.
Yoshino, Tatsuo: *See—*
Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Yamamoto, Takashi, 4,592,633, Cl. 354-76.000.
Yoshioka, Mitsuru: *See—*
Narisada, Masayuki; Onoue, Hiroshi; Tsuji, Teruji; Nishitani, Yasuhiro; Yoshioka, Mitsuru; Hamashima, Yoshio; and Nagata, Wataru, 4,592,865, Cl. 260-239.00A.
Young, John M.: *See—*
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,593,120, Cl. 560-107.000.
Young, Lester L. Louvered vent. 4,592,271, Cl. 98-114.000.
Young, Peter L.; Oprysko, Modest M.; and Beranek, Mark W., to Gould Inc. Method for repairing a photomask by laser-induced polymer degradation. 4,592,975, Cl. 430-5.000.
Young, Steven D.: *See—*
Hartman, George D.; Halczenko, Wasyl; and Young, Steven D., 4,593,033, Cl. 514-290.000.
Youngs, Wilbur R.: *See—*
Crites, Robert C.; and Youngs, Wilbur R., 4,592,187, Cl. 52-741.000.
Yu, Terry T.; and Yen, Mei-Rong, to Energy Conversion Devices, Inc. Synthesis method for reductant precursor. 4,592,867, Cl. 260-351.100.
Yunick, Henry, to Motortech, Inc. Apparatus and operating method for an internal combustion engine. 4,592,329, Cl. 123-545.000.
Yurioka, Nobutaka: *See—*
Saito, Shoji; Yurioka, Nobutaka; and Oshita, Shigeru, 4,593,174, Cl. 219-137.0WM.
Zahn, Wolfgang: *See—*
Freitag, Friedbert; Hujer, Friedrich; Nagel, Erich; Payrhammer, Bernd; and Zahn, Wolfgang, 4,592,649, Cl. 355-43.000.
Zarogatsky, Leonid P.; Ivanov, Nikolai A.; Korolkov, Mikhail F.; Laubgan, Villi R.; Safronov, Andrei N.; Turkin, Vladimir Y.; and Ivanov, Boris G. Inertia cone crusher. 4,592,517, Cl. 241-207.000.
Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,592,761, Cl. 44-57.000.
Zdrok, Joseph Z.: *See—*
Maryyanek, Richard D.; and Zdrok, Joseph Z., 4,592,350, Cl. 128-206.170.
Zeeh, Bernd: *See—*
Eicken, Karl; Rohr, Wolfgang; Zeeh, Bernd; and Wurzer, Bruno, 4,593,104, Cl. 548-262.000.
Zeiss Ikon AG: *See—*
Patzelt, Ingeborg; and Horn, Werner, 4,593,185, Cl. 235-382.000.
Zellner, John R. Tiltable bathtub for invalids. 4,592,099, Cl. 4-540.000.
Zenith Electronics Corporation: *See—*
Dietch, Leonard; and Palac, Kazimir, 4,593,225, Cl. 313-407.000.
Mudra, Robert E., 4,592,606, Cl. 339-31.00R.
Palac, Kazimir, 4,593,224, Cl. 313-402.000.
Zeoli, Kathryn: *See—*
Hsia, Sung L.; Voigt, Walter; Sawaya, Marty; and Zeoli, Kathryn, 4,593,021, Cl. 514-182.000.
Zeuschel, Donald W.: *See—*
Wright, Robert L.; and Zeuschel, Donald W., 4,592,152, Cl. 36-11.500.
Zeyher, Heinz: *See—*
Gorner, Bernd; and Zeyher, Heinz, 4,592,259, Cl. 83-13.000.
Zimmerman, Neil L. Seat lifter. 4,592,097, Cl. 4-251.000.
Zinser Textilmaschinen GmbH: *See—*
Wolf, Horst, 4,592,196, Cl. 57-74.000.
Wolf, Horst, 4,592,197, Cl. 57-277.000.
Zisselmar, Raimund: *See—*
Grigel, Wolfgang; Kellerwessel, Hans; and Zisselmar, Raimund, 4,592,512, Cl. 241-24.000.

Znidarsic, Nancy: *See*—
Dressler, Hans; Holter, Samuel N.; and Znidarsic, Nancy, 4,592,783, Cl. 106-14.050.
Zorkendorfer, Eckhard: *See*—
Ludwig, Gerhard; Simon, Jozsef; Zorkendorfer, Eckhard; Gappa, Gunther; Vaupel, Knut; and Klein, Jurgen, 4,592,837, Cl. 210-189.000.
Zulauf, Karlheinz: *See*—
Sigmund, Ludwig; Steigerwald, Franz; and Zulauf, Karlheinz, 4,592,376, Cl. 132-112.000.
Zupancic, Ronald L., to Union Carbide Corporation. Electrochemical cell having a safety vent closure. 4,592,970, Cl. 429-82.000.
Zweifel, Terry L.: *See*—
Miller, Harry; and Zweifel, Terry L., 4,593,285, Cl. 340-968.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JUNE, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AT&T Bell Laboratories: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,172, Cl. 381-46.000.

Berge, Arnulf, to Elkem A/s. Detection of flaws in metal members. Re. 32,166, Cl. 51-322.000.

Buente, Stephen M., to Eaton Corporation. Acting valve gear. Re. 32,167, Cl. 123-90.550.

Eaton Corporation: *See*—
Buente, Stephen M., Re. 32,167, Cl. 123-90.550.

Elkem A/s: *See*—
Berge, Arnulf, Re. 32,166, Cl. 51-322.000.

Etablissement Euroburner: *See*—
Piotrowski, Tadeusz, Re. 32,169, Cl. 165-89.000.

Gerring, Harold E., to Gerwin Vans, Inc. Method of assembling vehicle top structure. Re. 32,165, Cl. 29-401.100.

Gerwin Vans, Inc.: *See*—
Gerring, Harold E., Re. 32,165, Cl. 29-401.100.

Hitachi, Ltd.: *See*—
Yoshinari, Takashi, Re. 32,168, Cl. 123-647.000.

Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., to AT&T Bell Laboratories. Endpoint detector. Re. 32,172, Cl. 381-46.000.

Lamel, Lori F.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,172, Cl. 381-46.000.

Minnesota Mining and Manufacturing Company: *See*—
van Turnhout, Jan, Re. 32,171, Cl. 55-155.000.

Neumeier, Paul, to O. K. Partnership. Machine-retrievable card and-card retrieval apparatus and method therefor. Re. 32,170, Cl. 209-608.000.

O. K. Partnership: *See*—
Neumeier, Paul, Re. 32,170, Cl. 209-608.000.

Piotrowski, Tadeusz, to Etablissement Euroburner. Thermal exchanger. Re. 32,169, Cl. 165-89.000.

Rabiner, Lawrence R.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,172, Cl. 381-46.000.

Rosenberg, Aaron E.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,172, Cl. 381-46.000.

van Turnhout, Jan, to Minnesota Mining and Manufacturing Company. Method for the manufacture of an electret fibrous filter. Re. 32,171, Cl. 55-155.000.

Wilpon, Jay G.: *See*—
Johnston, James D.; Lamel, Lori F.; Rabiner, Lawrence R.; Rosenberg, Aaron E.; and Wilpon, Jay G., Re. 32,172, Cl. 381-46.000.

Yoshinari, Takashi, to Hitachi, Ltd. Distributor for contactless ignition apparatus for internal combustion engine. Re. 32,168, Cl. 123-647.000.

LIST OF DESIGN PATENTEES

Adams, Kenneth H. Covered geriatric's dish. 284,060, 6-3-86, Cl. D7-17.000.

Adkinson, Joseph E., deceased; and by Adkinson, Mary K., executrix. Breakfront or the like. 284,051, 6-3-86, Cl. D6-438.000.

Adkinson, Mary K., executrix: *See*—
Adkinson, Joseph E., deceased; and Adkinson, Mary K., executrix, 284,051, Cl. D6-438.000.

Akatsu, Masafuku: *See*—
Kita, Toshio; Akatsu, Masafuku; Yokoyama, Nagakazu; and Nakatani, Takeshi, 284,079, Cl. D14-58.000.

Ambasz, Emilio; and Piretti, Giancarlo, to Center for Design Research and Development N.V. Chair. 284,048, 6-3-86, Cl. D6-380.000.

Arnau (Pibet), Jose M., to Exin-Iber, S.A. Toy figure. 284,091, 6-3-86, Cl. D21-149.000.

Artistic Hair Products Company Limited, The: *See*—
Chao, Chen K., 284,120, Cl. D28-93.000.

Ashby, Simon. Respiratory sensor probe and housing therefor. 284,095, 6-3-86, Cl. D24-17.000.

Aspri Sports, Inc.: *See*—
Lowe, Ralph L., Jr.; and Elliott, Patrick S., 284,043, Cl. D2-310.000.

Bali Company: *See*—
DiTullio, Flavia, 284,037, Cl. D2-24.000.

Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., to Globe Tool & Engineering Company, The. Display panel for armature winding machine or the like. 284,085, 6-3-86, Cl. D15-138.000.

Barfell, Glenn H. Combined paper stacker and baler. 284,055, 6-3-86, Cl. D6-567.000.

Baumgartner, Robert L., to Scholl, Inc. Foot file. 284,118, 6-3-86, Cl. D28-59.000.

Bellis, Robert D.: *See*—
Tod, Timothy W.; Tod, Roger J.; and Bellis, Robert D., 284,065, Cl. D8-499.000.

Bergelin, Christopher S., to Gordon's Inc. Table. 284,054, 6-3-86, Cl. D6-484.000.

Bioself Development S.A.: *See*—
Desjacques, Edmond, 284,096, Cl. D24-17.000.

Birring, Mats G., to Molnlycke Aktiebolag. Diaper pants. 284,036, 6-3-86, Cl. D2-10.000.

Black & Decker, Inc.: *See*—
McCloskey, Donald R., 284,105, Cl. D26-37.000.

Blunden, Douglas P. Display rack. 284,052, 6-3-86, Cl. D6-457.000.

Bonetto, Rodolfo, to Iguzzini Illuminazione S.p.A. Adjustable table lamp. 284,108, 6-3-86, Cl. D26-65.000.

Browne, Lloyd E., to Richardson-Vicks, Inc. Fly trap. 284,093, 6-3-86, Cl. D22-19.000.

Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., to Simmons Universal Corporation. Door hutch. 284,050, 6-3-86, Cl. D6-432.000.

Burke, Donald D. Cable drive for a sewer cleaning machine. 284,125, 6-3-86, Cl. D32-14.000.

Carter Industries, Inc.: *See*—
Staats, Thomas A.; Smitherman, Robert A.; and Hoover, William E., 284,046, Cl. D6-335.000.

Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio; and Piretti, Giancarlo, 284,048, Cl. D6-380.000.

Century Boat Company: *See*—
Hegg, Allan B.; Makowski, Lloyd S.; and Phares, James S., 284,075, Cl. D12-314.000.

Chao, Chen K., to Artistic Hair Products Company Limited, The. Wig modelling stand. 284,120, 6-3-86, Cl. D28-93.000.

Chinchar, Victor M. Holder for multiple reading material. 284,053, 6-3-86, Cl. D6-469.000.

Christensen, James M.: *See*—
Laporta, Guido A.; and Christensen, James M., 284,099, Cl. D24-33.000.

Civre, Varet J., to Sodalco S.p.A. Container for towels, napkins, and the like. 284,066, 6-3-86, Cl. D9-339.000.

Coin Controls Limited: *See*—
Tod, Timothy W.; Tod, Roger J.; and Bellis, Robert D., 284,065, Cl. D8-499.000.

Collis, Harvey E., to Molton Brown U.S.A. Inc. Hair roller. 284,117, 6-3-86, Cl. D28-37.000.

Czerny, Anton R., to Taunus Textildruck Zimmer GmbH & Co. KG. Textile wall covering. 284,131, 6-3-86, Cl. D5-53.000.

Danfoss A/S: *See*—
Moeller, Jorgen J., 284,076, Cl. D13-40.000.

Daniels, Eric A.: *See*—
Swezey, Kenneth N.; Ishimoto, Thomas H.; and Daniels, Eric A., 284,080, Cl. D14-70.000.

Daystar Shelter Corporation: *See*—
Wolfe, Sheldon P., 284,103, Cl. D25-61.000.

Desjacques, Edmond, to Bioself Development S.A. Combination case for an electronic calculator and thermometer probe for family planning. 284,096, 6-3-86, Cl. D24-17.000.

Diffrient, Niels, to Hauserman Inc. Task light design. 284,107, 6-3-86, Cl. D26-63.000.

Di Martino, James D. Embroidery hoop holder. 284,044, 6-3-86, Cl. D3-26.000.

DiTullio, Flavia, to Bali Company. Brassiere. 284,037, 6-3-86, Cl. D2-24.000.

Dobbs Houses, Inc.: *See—*
Simonian, Rouben, 284,102, Cl. D25-22.000.
Draheim, Harvey J.: *See—*
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 284,050, Cl. D6-432.000.
Drane, John H., to Duracell Inc. Hand lantern. 284,106, 6-3-86, Cl. D26-44.000.
Duracell Inc.: *See—*
Drane, John H., 284,106, Cl. D26-44.000.
Durand, Jean-Jacques. Goblet or similar article. 284,059, 6-3-86, Cl. D7-13.000.
Eghamn, Lars; and Soderberg, Arne. Shin guard. 284,038, 6-3-86, Cl. D2-27.000.
Eichstadt, Frank T., to Mr. Gasket Company. Foot pedal pad for automotive vehicles. 284,070, 6-3-86, Cl. D12-174.000.
Eichstadt, Frank T., to Mr. Gasket Company. Pedal pad for automotive vehicles. 284,071, 6-3-86, Cl. D12-174.000.
Elliott, Patrick S.: *See—*
Lowe, Ralph L., Jr.; and Elliott, Patrick S., 284,043, Cl. D2-310.000.
English, George J.; and Levin, Robert E., to GTE Products Corporation. Lens member for a motor vehicle headlighting system. 284,112, 6-3-86, Cl. D26-122.000.
Everingham Brothers Limited: *See—*
Poissant, Philip L., 284,064, Cl. D8-311.000.
Exin-Iber, S.A.: *See—*
Arnau (Pibet), Jose M., 284,091, Cl. D21-149.000.
Eyzaguirre, Ramon C., to Heinicke Instruments Co. Washer. 284,123, 6-3-86, Cl. D32-2.000.
Feigin, David E.: *See—*
Kahn, Richard; and Feigin, David E., 284,058, Cl. D7-1.000.
Ferrara, Daniel A., Jr., to Summagraphics Corporation. Digitizer. 284,084, 6-3-86, Cl. D14-114.000.
Finegold, Hyman B.: *See—*
Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., 284,085, Cl. D15-138.000.
Fiskars Oy AB: *See—*
Linden, Erkki O., 284,063, Cl. D8-5.000.
Flodman, Michael R., to Hedstrom Corporation. Wheel. 284,073, 6-3-86, Cl. D12-211.000.
Ford, John M. B.; and Magers, Wallace F., to Realex Corporation. Dispensing head. 284,068, 6-3-86, Cl. D9-448.000.
Globe Tool & Engineering Company, The: *See—*
Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., 284,085, Cl. D15-138.000.
Gordon's Inc.: *See—*
Bergelin, Christopher S., 284,054, Cl. D6-484.000.
Goto, Tetsuya, to Richo Company, Ltd. Sorter for copying machine. 284,086, 6-3-86, Cl. D16-32.000.
Green, David T., to United States Surgical Corporation. Linear surgical stapler. 284,097, 6-3-86, Cl. D24-26.000.
Green, David T., to United States Surgical Corporation. Linear surgical stapler. 284,098, 6-3-86, Cl. D24-26.000.
GTE Products Corporation: *See—*
English, George J.; and Levin, Robert E., 284,112, Cl. D26-122.000.
Haidinger, Robert N., to Jac Jacobsen Industries, Inc. Magnifying lamp. 284,087, 6-3-86, Cl. D16-135.000.
Hara, Kunio: *See—*
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LIST OF STATUTORY INVENTION REGISTRATIONS

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Appell, Herbert R.; Narain, Nand K.; and Utz, Bruce R., to United States of America, Energy. Solvent treatment of coal for improved liquefaction. H69, 6-3-86, Cl. 208-8.0LE.

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4,592,760
57 4,592,761

CLASS 47

1.5 4,592,164
25 4,592,165
67 4,592,166

CLASS 48

197 R 4,592,762

CLASS 49

171 4,592,167
177 4,592,168

CLASS 51

118 4,592,169
170 MT 4,592,170
246 4,592,171
291 4,592,172
322 Re.32,166
330 4,592,173

CLASS 52

12 4,592,174
79.9 4,592,175
96 4,592,176
116 4,592,177
155 4,592,178
172 4,592,179
203 4,592,180
223 L 4,592,181
233 4,592,182
309.4 4,592,183
334 4,592,184
543 4,592,185
699 4,592,186
741 4,592,187

CLASS 53

137 4,592,188
4,592,189
491 4,592,190
509 4,592,191
512 4,592,192
530 4,592,193

CLASS 55

2 4,592,763
155 Re.32,171
276 4,592,764
306 4,592,765

CLASS 56

16.4 4,592,194

CLASS 57

58.36 4,592,195
74 4,592,196
277 4,592,197
401 4,592,198

CLASS 60

39.161 4,592,204
226.1 4,592,199
261 4,592,200
262 4,592,201
264 4,592,202
358 4,592,203

CLASS 62

18 4,592,766
31 4,592,767
49 4,592,205
160 4,592,206
244 4,592,207
255 4,592,209
288 4,592,210
323.1 4,592,208
532 4,592,768

CLASS 63

15.5 4,592,211

CLASS 65

4.4 4,592,769
128 4,592,770

CLASS 66

9 B 4,592,213
91 4,592,212
149 R 4,592,214
216 4,592,215

CLASS 68

5 E 4,592,216

CLASS 70

164 4,592,218
456 R 4,592,219

CLASS 71

34 4,592,771
76 4,592,772
88 4,592,773
90 4,592,774
4,592,775
93 4,592,776

CLASS 72

16 4,592,220
84 4,592,221
97 4,592,222
142 4,592,223
264 4,592,224
457 4,592,225

CLASS 73

59 4,592,226
61.4 4,592,227
118 4,592,228
129 4,592,217
147 4,592,229
295 4,592,230
4,592,231
505 4,592,232
510 4,592,233
517 B 4,592,234
517 R 4,592,235
602 4,592,236
4,592,237
727 4,592,238
861.22 4,592,240
861.66 4,592,239
862.34 4,592,241

CLASS 74

5 F 4,592,242
7 E 4,592,243
57 4,592,244
89.21 4,592,245
190 4,592,246
198 4,592,247
417 4,592,248
473 R 4,592,249
688 4,592,250
785 4,592,251

CLASS 75

58 4,592,777
59.22 4,592,778
101 R 4,592,779
229 4,592,780
249 4,592,781
253 4,592,782

CLASS 76

108 A 4,592,252

CLASS 81

9.51 4,592,253
57.29 4,592,256
57.39 4,592,254
57.4 4,592,258
63 4,592,255
429 4,592,257

CLASS 83

13 4,592,259
74 4,592,260
102.1 4,592,261

CLASS 84

115 4,592,262
173 4,592,263
274 4,592,264
327 4,592,265
4,592,266

CLASS 92

128 4,592,267
212 4,592,268

CLASS 98

2.14 4,592,269
39.1 4,592,270
114 4,592,271

CLASS 99

353 4,592,272
358 4,592,273
452 4,592,274
495 4,592,275

CLASS 101

38 A 4,592,276
38 R 4,592,277
181 4,592,278
412 4,592,279

CLASS 102

202.2 4,592,280
254 4,592,281
313 4,592,282
493 4,592,283

CLASS 104

140 4,592,284

CLASS 106

14.05 4,592,783

CLASS 108

9 4,592,285
108 4,592,286
113 4,592,287

CLASS 110

236 4,592,288
345 4,592,289
346 4,592,290
4,592,291
347 4,592,292
4,592,293

CLASS 111

7 4,592,294

CLASS 112

65 4,592,295
83 4,592,296
443 4,592,297

CLASS 114

39 4,592,298
162 4,592,299
302 4,592,300

CLASS 116

67 R 4,592,301

CLASS 118

303 4,592,302
409 4,592,303
415 4,592,304
677 4,592,305
719 4,592,306
4,592,307
726 4,592,308

CLASS 123

39 4,592,309
52 M 4,592,310
73 A 4,592,311
80 BB 4,592,312
90.14 4,592,313
90.36 4,592,314
90.55 Re.32,167
188 M 4,592,315
195 C 4,592,316
198 B 4,592,317
295 4,592,318
321 4,592,319
339 4,592,320
4,592,321
361 4,592,322
362 4,592,323
424 4,592,324
489 4,592,325
494 4,592,326
502 4,592,327
531 4,592,328
545 4,592,329
559 4,592,330
647 Re.32,168
660 4,592,331

CLASS 124

41 A 4,592,332

CLASS 126

21 R 4,592,333
25 A 4,592,335
25 B 4,592,334
314 4,592,336
424 4,592,337

CLASS 128

1 D 4,592,340
1 R 4,592,338
4,592,339
4,592,342
4 4,592,341
11 4,592,343
13 4,592,344
33 4,592,345
92 B 4,592,346
127 4,592,347
200.23 4,592,348
204.25 4,592,349
206.17 4,592,350
207.17 4,592,351
303 B 4,592,352
303.1 4,592,353
305 4,592,354
326 4,592,355
339 4,592,356
342 4,592,357
402 4,592,358
419 PG 4,592,360
419 R 4,592,359
633 4,592,361
653 4,592,362
4,592,363
672 4,592,364
680 4,592,365
4,592,366
706 4,592,367
719 4,592,368
733 4,592,369
746 4,592,370
774 4,592,371
786 4,592,372

CLASS 131

276 4,592,373
282 4,592,374

CLASS 132

39 4,592,375
112 4,592,376

CLASS 133

5 R 4,592,377

CLASS 134

15 4,592,784
18 4,592,785
22.18 4,592,786
38 4,592,787
111 4,592,378

CLASS 136

244 4,593,151
246 4,593,152

CLASS 137

119 4,592,379
155 4,592,380
203 4,592,381
218 4,592,382
454.6 4,592,383
494 4,592,384
505.13 4,592,385
588 4,592,386
614.06 4,592,387
615 4,592,388
625.22 4,592,389

CLASS 138

45 4,592,390
98 4,592,391

CLASS 139

1 E 4,592,392
11 4,592,393
370.1 4,592,394
383 A 4,592,395
425 A 4,592,396

CLASS 141

18 4,592,397

CLASS 144

3 D 4,592,398
229 4,592,399
253 E 4,592,400
346 4,592,401
4,592,402

CLASS 148

12 B 4,592,788
111 4,592,789
126.1 4,592,790
171 4,592,791
175 4,592,792
189 4,592,793

CLASS 152

158 4,592,403

CLASS 156

89 4,592,794
203 4,592,795
450 4,592,796
574 4,592,797
578 4,592,798
617 R 4,592,799
643 4,592,800
4,592,801
644 4,592,802

CLASS 159

4.02 4,592,803

CLASS 162

19 4,592,804

CLASS 164

46 4,592,404
120 4,592,405
169 4,592,406
265 4,592,407
413 4,592,408
442 4,592,409
453 4,592,410
463 4,592,411

CLASS 165

2 4,592,412
59 4,592,413
76 4,592,414
80.5 4,592,415
83 4,592,416
89 Re.32,169
95 4,592,417
104.32 4,592,418
112 4,592,419
151 4,592,420

CLASS 166

66 4,592,421
96 4,592,422
248 4,592,423
263 4,592,424
312 4,592,425
347 4,592,426
369 4,592,427

CLASS 172

81 4,592,428
212 4,592,429

CLASS 173

12 4,592,430
103 4,592,431

CLASS 174

34 4,593,153

CLASS 175

26 4,592,432
329 4,592,433

CLASS 177

25 4,592,434
132 4,592,435

CLASS 178

2 D 4,593,154

CLASS 179

2 EA 4,593,155
16 AA 4,593,156
90 BD 4,593,157
100 R 4,593,158
4,593,159
110 A 4,593,160
170.2 4,593,161

CLASS 180

2.2 4,592,436
68.6 4,592,437
89.1 4,592,438
140 4,592,439
155 4,592,440
217 4,592,441
247 4,592,442
272 4,592,443

CLASS 181

151 4,592,444
229 4,592,445

CLASS 182

93 4,592,446
127 4,592,447

CLASS 184

1.5 4,592,448

CLASS 187

9 E 4,592,449
19 4,592,450

CLASS 188

71.9 4,592,451
264 AA 4,592,452

CLASS 192

0.02 R 4,592,453
0.076 4,592,457
3.23 4,592,454
13 R 4,592,455
58 B 4,592,456
83 4,592,458
106.2 4,592,459
4,592,460

CLASS 194

227 4,592,461

CLASS 198

464.2 4,592,462
842 4,592,463

CLASS 200

51.09 4,593,162
80 R 4,593,163
83 J 4,593,166
144 B 4,593,164
4,593,165

CLASS 203

51 4,592,805
71 4,592,806

CLASS 204

2.1 4,592,807
20 4,592,808
44.2 4,592,809
59 R 4,592,810
67 4,592,812
4,592,813
73 R 4,592,811
78 4,592,814
165 4,592,815
180.6 4,592,816
182.4 4,592,817
196 4,592,818
203 4,592,819
243 R 4,592,820
244 4,592,821
252 4,592,822
409 4,592,823
416 4,592,824
426 4,592,825

CLASS 206

0.83 4,592,465
45.28 4,592,464
150 4,592,466
349 4,592,467
387 4,592,468
494 4,592,469

CLASS 208

59 4,592,827
89 4,592,828
4,592,829
94 4,592,830
309 4,592,831
4,592,832
407 4,592,826

CLASS 209

44 4,592,833
166 4,592,834
535 4,592,470
608 Re.32,170

CLASS 210

107 4,592,835
168 4,592,836
189 4,592,837
323.1 4,592,838
352 4,592,839
493.5 4,592,840
651 4,592,841
659 4,592,842
692 4,592,843
709 4,592,844
715 4,592,845
747 4,592,846
770 4,592,847
798 4,592,848
799 4,592,849

CLASS 211

41 4,592,471
119.01 4,592,472
205 4,592,473

CLASS 212

267 4,592,474

CLASS 215

252 4,592,475
4,592,476
334 4,592,477

CLASS 219

10.55 B 4,593,167
10.55 E 4,593,170
10.55 M 4,593,168
4,593,171
10.55 R 4,593,169
85 M 4,593,172
124.34 4,593,173
137 WM 4,593,174
203 4,593,175
279 4,593,176
315 4,593,178
328 4,593,177
370 4,593,179
492 4,593,180
541 4,593,181
544 4,593,182

CLASS 220

23.83 4,592,478
209 4,592,479
270 4,592,480
307 4,592,481
318 4,592,482
379 4,592,483

CLASS 221

13 4,592,484
150 HC 4,592,485
283 4,592,486

CLASS 222

94 4,592,487
4,592,488
4,592,489
129.1 4,592,490
146.5 4,592,491
209 4,592,492
212 4,592,493
252 4,592,494
526 4,592,495

CLASS 223

68 4,592,496
69 4,592,497

CLASS 227

19 4,592,498
67 4,592,499
4,592,500
119 4,592,501
131 4,592,502

CLASS 228

147 4,592,503

CLASS 235

379 4,593,183
382 4,593,185
449 4,593,184
472 4,593,186

CLASS 237

19 4,592,504

CLASS 239

69 4,592,505
139 4,592,506
172 4,592,507
265.19 4,592,508
424 4,592,509
432 4,592,510

CLASS 241

14 4,592,511
24 4,592,512
46.17 4,592,513
55 4,592,514
69 4,592,515
76 4,592,516
207 4,592,517

CLASS 242

78.7 4,592,518
86 4,592,519
107 4,592,520
158 R 4,592,521
193 4,592,522

CLASS 244

3.28 4,592,525
122 AG 4,592,523
151 B 4,592,524

CLASS 248

278 4,592,526
318 4,592,527
359 4,592,528
475.1 4,592,529
4,592,530
646 4,592,531
649 4,592,532

CLASS 250

203 R 4,593,187
204 4,593,188
221 4,593,189
223 R 4,593,190
227 4,593,191
229 4,593,192
231 SE 4,593,193
4,593,194
253 4,593,195
305 4,593,196
343 4,593,197
366 4,593,198
484.1 4,593,199
492.2 4,593,200
517.1 4,593,201

CLASS 251

30.01 4,592,533
266 4,592,534
298 4,592,535

CLASS 252

8.55 D 4,592,850
32.7 E 4,592,851
75 4,592,853
79.1 4,592,852
79.3 4,592,854
89.1 4,592,855
162 4,592,856
299.61 4,592,857
299.66 4,592,858
309 4,592,859
376 4,592,860
511 4,592,861
4,592,862
551 4,592,875

CLASS 254

8 R 4,592,536

CLASS 260

239 A 4,592,865
239.3 T 4,592,866
351.1 4,592,867
397.1 4,592,868
397.4 4,592,869
410.6 4,592,870
511 4,592,876

CLASS 261

109 4,592,877
111 4,592,878

CLASS 264

12 4,592,879
22 4,592,880
40.1 4,592,881
66 4,592,882
82 4,592,883
132 4,592,884
171 4,592,885
262 4,592,886
337 4,592,887

CLASS 266

78 4,592,537
216 4,592,538
246 4,592,539

CLASS 267

8 R 4,592,540

CLASS 269

155 4,592,541

CLASS 271

9 4,592,542
227 4,592,543

CLASS 272

73 4,592,544
125 4,592,545

CLASS 273

1 E 4,592,546
29 A 4,592,547
43 A 4,592,548
58 C 4,592,549
61 C 4,592,550
63 E 4,592,551
168 4,592,552
240 4,592,553
312 4,592,554
402 4,592,555

CLASS 277

27 4,592,556
80 4,592,557
205 4,592,558
214 4,592,559

CLASS 279

81 4,592,560

CLASS 280

91 4,592,561
242 WC 4,592,562
253 4,592,563
402 4,592,564
432 4,592,565
433 4,592,566
602 4,592,567
607 4,592,568
624 4,592,569
650 4,592,570
756 4,592,571

CLASS 281

2 4,592,572

CLASS 283

56 4,592,573

CLASS 285

31 4,592,574
252 4,592,575
253 4,592,576
287 4,592,577

CLASS 290

54 4,593,202

CLASS 292

40 4,592,578
327 4,592,579

CLASS 293

136 4,592,580

CLASS 294

2 4,592,581
137 4,592,582

CLASS 296

39 R 4,592,583
153 4,592,584
181 4,592,585
218 4,592,586

CLASS 297

284 4,592,587
4,592,588
4,592,589
347 4,592,590
375 4,592,591
483 4,592,592

CLASS 298

22 J 4,592,593

CLASS 300

21 4,592,594

CLASS 301

63 PW 4,592,595
132 4,592,596

CLASS 303

15 4,592,597
37 4,592,598
119 4,592,599

CLASS 307

202.1 4,593,203
252 C 4,593,204
269 4,593,205
270 4,593,206
271 4,593,207
296 R 4,593,208
419 4,593,209
443 4,593,210
455 4,593,211
475 4,593,212
564 4,593,213
578 4,593,214

CLASS 310

36 4,593,215
49 4,593,216
90 4,593,217
103 4,593,218
218 4,593,219
239 4,593,220
242 4,593,221
254 4,593,222
258 4,593,223

CLASS 312

12 4,592,600
111 4,592,601
223 4,592,602
241 4,592,603
245 4,592,604

CLASS 313

402 4,593,224
407 4,593,225
413 4,593,226
482 4,593,227
509 4,593,228
533 4,593,229

CLASS 315

14 4,593,230
100 4,593,231
199 4,593,232
307 4,593,233
362 4,593,234
381 4,593,235

CLASS 318

7 4,593,236
561 4,593,237
587 4,593,238
4,593,239
800 4,593,240

CLASS 323

294 4,593,241

CLASS 324

121 R 4,593,242
158 P 4,593,243
230 4,593,244
238 4,593,245
307 4,593,246
309 4,593,247
317 4,593,248

CLASS 328

137 4,593,249

CLASS 330

107 4,593,250
123 4,593,251
260 4,593,252

CLASS 331

1 A 4,593,253
4,593,254
117 R 4,593,255
4,593,256
4,593,257
176 4,593,258

CLASS 333

22 F 4,593,259

CLASS 335

195 4,593,260
300 4,593,261

CLASS 337

163 4,593,262

CLASS 339

8 R 4,592,605
31 R 4,592,606
37 4,592,607
42 4,592,608
4,592,609
65 4,592,610
91 R 4,592,611
143 R 4,592,612
147 P 4,592,613
154 A 4,592,614
176 L 4,592,615
177 R 4,592,616
275 B 4,592,617

CLASS 340

52 D 4,593,263
52 R 4,593,264
114 B 4,593,265
347 AD 4,593,266
4,593,268
4,593,270
347 DA 4,593,271
347 DD 4,593,267
347 P 4,593,269
500 4,593,272
539 4,593,273
4,593,274
604 4,593,275
664 4,593,276
680 4,593,277
748 4,593,278
811 4,593,279
825.05 4,593,280
825.07 4,593,283
825.5 4,593,281
4,593,282
870.18 4,593,284
968 4,593,285

CLASS 343

7 A 4,593,286
17.5 4,593,287
705 4,593,288
795 4,593,289
900 4,593,290

CLASS 346

1.1 4,593,291
4,593,292
136 4,593,293
140 R 4,593,294
4,593,295
4,593,296
160 4,593,297
200 4,593,298

CLASS 350

3.61 4,592,618
96.11 4,592,619
174 4,592,620
358 4,592,621
395 4,592,622
397 4,592,623
414 4,592,624
415 4,592,625
427 4,592,626
432 4,592,627
486 4,592,628

CLASS 351

41 4,592,629
169 4,592,630
206 4,592,631

CLASS 352

214 4,592,632

CLASS 354

76 4,592,633
105 4,592,634
133 4,592,635
225 4,592,636
403 4,592,637
4,592,638
416 4,592,639
422 4,592,640

CLASS 355

3 BE 4,592,644
3 DD 4,592,642
4,592,653
3 R 4,592,643
3 TR 4,592,641
14 D 4,592,645
14 R 4,592,646
40 4,592,647
43 4,592,648
4,592,649
53 4,592,650
72 4,592,651
76 4,592,652

CLASS 356

247 4,592,654
313 4,592,655
350 4,592,656

CLASS 357

22 4,593,300
4,593,301
23.4 4,593,302
24 4,593,303
30 4,593,304
34 4,593,305
45 4,593,306
67 4,593,307

CLASS 358

10 4,593,308
4,593,309
37 4,593,310
51 4,593,311
98 4,593,313
112 4,593,314
140 4,593,315
4,593,316
4,593,317
142 4,593,318
213 4,593,319
4,593,320
219 4,593,321
227 4,593,322
256 4,593,323
261 4,593,324
282 4,593,325

299 4,593,326
330 4,593,327
909 4,593,312

CLASS 360

2 4,593,328
75 4,593,329
85 4,593,330
93 4,593,331
111 4,593,332
125 4,593,333
126 4,593,334
130.33 4,593,335
131 4,593,336
137 4,593,337

CLASS 361

18 4,593,338
215 4,593,339
253 4,593,340
310 4,593,341
386 4,593,342
433 4,593,343

CLASS 362

226 4,593,344
267 4,593,345

CLASS 363

21 4,593,346
4,593,347
85 4,593,348

CLASS 364

200 4,593,349
4,593,350
4,593,351
4,593,352
4,593,353
4,593,354
414 4,593,355
419 4,593,356
424 4,593,357
4,593,358
443 4,593,359
468 4,593,360
479 4,593,361
488 4,593,362
491 4,593,363
494 4,593,364
510 4,593,365
513 4,593,366
4,593,367
525 4,593,368
552 4,593,369
571 4,593,370
4,593,371
719 4,593,372
736 4,593,373
900 4,593,374
4,593,375
4,593,376
4,593,377
4,593,378
4,593,379
4,593,380

CLASS 365

45 4,593,381
149 4,593,382
203 4,593,383
228 4,593,384

CLASS 366

134 4,592,657
265 4,592,658

CLASS 367

149 4,593,385

CLASS 368

1 4,592,659
286 4,592,660

CLASS 369

46 4,593,386

CLASS 370

58 4,593,387
67 4,593,388
110.1 4,593,389
112 4,593,390

CLASS 371

15 4,593,391
31 4,593,392
37 4,593,393
39 4,593,394
40 4,593,395
68 4,593,396

CLASS 372

82 4,593,397

CLASS 374

10 4,592,661
57 4,592,662
117 4,592,663
131 4,592,664
143 4,592,665

CLASS 375

27 4,593,398
104 4,593,399

CLASS 376

299 4,592,888

CLASS 378

99 4,593,400
168 4,593,401

CLASS 381

16 4,593,402
43 4,593,403
46 Re.32,172
82 4,593,404
99 4,593,405

CLASS 382

44 4,593,406
46 4,593,407

CLASS 383

43 4,593,408

CLASS 384

477 4,592,666
593 4,592,667

CLASS 400

127 4,592,668
621 4,592,669
637.6 4,592,670

CLASS 403

171 4,592,671
205 4,592,672

CLASS 404

1 4,592,673
25 4,592,674

CLASS 405

19 4,592,675
36 4,592,676
59 4,592,677
284 4,592,678

CLASS 406

127 4,592,679

CLASS 407

36 4,592,680

CLASS 408

10 4,592,681
241 R 4,592,682

CLASS 409

83 4,592,683
132 4,592,684
138 4,592,685

CLASS 410

101 4,592,686

CLASS 411

4 4,592,687
349 4,592,688
358 4,592,689

CLASS 413

19 4,592,690

CLASS 414

4 4,592,691
70 4,592,692
495 4,592,693
534 4,592,694
678 4,592,695
685 4,592,696
719 4,592,697
786 4,592,698

CLASS 415

126 4,592,699
213 A 4,592,700

CLASS 416

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366 4,592,703

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171 4,592,706

CLASS 419

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CLASS 420

442 4,592,890
491 4,592,891

CLASS 422

28 4,592,892
56 4,592,893
69 4,592,894
106 4,592,895
109 4,592,896
145 4,592,897
159 4,592,898
180 4,592,899

CLASS 423

167 4,592,900
320 4,592,901
328 4,592,902
359 4,592,903
472 4,592,904
573 R 4,592,905

CLASS 424

60 4,592,906
70 4,592,907
71 4,592,908
127 4,592,909
195.1 4,592,910
4,592,911
4,592,912

CLASS 425

7 4,592,707
80.1 4,592,708
126 S 4,592,709
141 4,592,710
144 4,592,711
145 4,592,712
150 4,592,713
4,592,714
308 4,592,715
330 4,592,716
400 4,592,717
504 4,592,718
526 4,592,719
4,592,720
558 4,592,721

CLASS 426

104 4,592,913
107 4,592,914
321 4,592,915
517 4,592,916
533 4,592,917
4,592,918
568 4,592,919

CLASS 427

2 4,592,920
9 4,592,921
34 4,592,922
35 4,592,923
45.1 4,592,924
74 4,592,925
82 4,592,926
87 4,592,927
93 4,592,928
98 4,592,929
133 4,592,930
136 4,592,931
163 4,592,932
255.1 4,592,933
355 4,592,934

CLASS 428

11 4,592,936
31 4,592,937
35 4,592,938
64 4,592,939
96 4,592,940
113 4,592,941
148 4,592,942
171 4,592,943
195 4,592,944
4,592,945
200 4,592,946
212 4,592,947
216 4,592,948
224 4,592,949
284 4,592,950
323 4,592,951
4,592,952
332 4,592,953
335 4,592,954
389 4,592,955
391 4,592,956
402.21 4,592,957
432 4,592,958
450 4,592,959
461 4,592,960
480 4,592,961
541 4,592,962
544 4,592,963
610 4,592,964
621 4,592,965
659 4,592,935
689 4,592,966
697 4,592,967

CLASS 429

34 4,592,968
50 4,592,969
82 4,592,970
105 4,592,971
160 4,592,972
206 4,592,973
229 4,592,974

CLASS 430

5 4,592,975
10 4,592,976
18 4,592,977
57 4,592,979
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59 4,592,984
84 4,592,985
98 4,592,986
102 4,592,987
107 4,592,988
110 4,592,989
137 4,592,990
139 4,592,991
309 4,592,992
313 4,592,993

CLASS 432

13 4,592,722
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78 4,592,724

CLASS 433

7 4,592,725
31 4,592,726
71 4,592,727
80 4,592,728
142 4,592,729

CLASS 434

22 4,592,730
184 4,592,731

CLASS 435

7 4,592,994
4,592,995
11 4,592,996
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28 4,592,998
78 4,592,999
88 4,593,000
94 4,593,001
172.3 4,593,002
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181 4,593,004
203 4,593,005

CLASS 440

61 4,592,732
88 4,592,733

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CLASS 455

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129 4,593,412
139 4,593,413
186 4,593,414

CLASS 464

111 4,592,735
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CLASS 474

19 4,592,737
80 4,592,738

CLASS 493

415 4,592,739

CLASS 501

32 4,593,006
105 4,593,007
135 4,593,008

CLASS 502

107 4,593,009
115 4,593,010
161 4,593,011
167 4,593,012
4,593,013
242 4,593,014
303 4,593,015
339 4,593,016

CLASS 514

16 4,593,017
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46 4,593,019
159 4,593,020
182 4,593,021
206 4,593,022
233 4,593,023
234 4,593,024
245 4,593,025
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253 4,593,027
256 4,593,028
267 4,593,029
269 4,593,030
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290 4,593,033
305 4,593,034
312 4,593,035
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328 4,593,038
362 4,593,039
395 4,593,040
457 4,593,041
523 4,593,042
547 4,593,043
557 4,593,044
562 4,593,045
717 4,593,046
726 4,593,047
778 4,593,048

CLASS 521

99 4,593,049

CLASS 522

2 4,593,050
31 4,593,051
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CLASS 523

111 4,593,053
118 4,593,054
122 4,593,055
445 4,593,056

CLASS 524

111 4,593,057
122 4,593,058
181 4,593,059
397 4,593,060
417 4,593,061
426 4,593,062
505 4,593,063
718 4,593,064
860 4,593,065

CLASS 525

66 4,593,066
92 4,593,067
100 4,593,068
113 4,593,069
139 4,593,070
288 4,593,071
326.5 4,593,072
328.4 4,593,073
331.7 4,593,074
356 4,593,075
425 4,593,076
444 4,593,077
497 4,593,078

CLASS 526

100 4,593,079
208 4,593,080
211 4,593,081
216 4,593,082
262 4,593,083

CLASS 528

15 4,593,084
18 4,593,085
173 4,593,086

CLASS 530

350 4,592,863
356 4,592,864

CLASS 534

768 4,593,088
784 4,593,087

CLASS 536

13.6 4,593,089
17.4 4,593,090
53 4,593,091

CLASS 544

6 4,593,092
22 4,593,093
224 4,593,094
272 4,593,095
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4,593,096
347 4,593,097
373 4,593,098

CLASS 546

114 4,593,099
115 4,593,100
153 4,593,101
216 4,593,102

CLASS 548

239 4,593,103
251 4,593,108
262 4,593,104
329 4,593,105
485 4,593,106
496 4,593,107

CLASS 549

347 4,593,110
467 4,593,109

CLASS 556

136 4,593,113
410 4,593,111
450 4,593,114
480 4,593,112

CLASS 558

2 4,592,871
59 4,592,873
281 4,592,872
283 4,592,874

CLASS 560

1 4,593,115
24 4,593,116
41 4,593,118
42 4,593,119
025 4,593,117
107 4,593,120
144 4,593,121

CLASS 562

414 4,593,122

CLASS 564

127 4,593,123
409 4,593,124

CLASS 568

319 4,593,125
427 4,593,130
454 4,593,126
4,593,127
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618 4,593,142
632 4,593,131
665 4,593,143
701 4,593,128
716 4,593,129
936 4,593,144

CLASS 570

150 4,593,132

CLASS 585

415 4,593,133
445 4,593,134
446 4,593,135
4,593,136
467 4,593,137
481 4,593,138
500 4,593,139
508 4,593,140
607 4,593,145
667 4,593,146
733 4,593,147
823 4,593,148
828 4,593,149
4,593,150

CLASS 604

15 4,592,740
35 4,592,741
71 4,592,742
82 4,592,743
192 4,592,744
211 4,592,745
220 4,592,746
246 4,592,747
279 4,592,748
283 4,592,749
337 4,592,750
368 4,592,751
895 4,592,752
897 4,592,753

CLASS 623

1 4,592,754
8 4,592,755

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D2—	10	284,036		438	284,051		433	284,067		111	284,083			284,098	D28—	3	284,114
	24	284,037		457	284,052		448	284,068		114	284,084		33	284,099			284,115
	27	284,038		469	284,053	D10—	118	284,069	D15—	28	284,116			284,100		37	284,117
	310	284,039		484	284,054	D12—	174	284,070		138	284,085	D25—	1	284,101		59	284,118
		284,040		567	284,055			284,071	D16—	32	284,086		22	284,102		89	284,119
		284,041		601	284,056		185	284,072		135	284,087		61	284,103		93	284,120
		284,043		611	284,057		211	284,073	D18—	9	284,088	D26—	24	284,104	D30—	40	284,121
	448	284,042	D7—	1	284,058		308	284,074	D19—	39	284,089		37	284,105		45	284,122
D3—	26	284,044		13	284,059		314	284,075	D21—	13	284,090		44	284,106	D32—	2	284,123
D4—	116	284,045		17	284,060	D13—	40	284,076		149	284,091		63	284,107		6	284,124
D5—	53	284,131		43	284,061	D14—	11	284,077		242	284,092		65	284,108		14	284,125
D6—	335	284,046		77	284,062		53	284,078	D22—	19	284,093		72	284,109		40	284,126
	353	284,047	D8—	5	284,063		58	284,079	D23—	154	284,094		76	284,110			284,127
	380	284,048		311	284,064		70	284,080	D24—	17	284,095		110	284,111		46	284,128
	408	284,049		499	284,065		76	284,081			284,096		122	284,112	D34—	21	284,129
	432	284,050	D9—	339	284,066		78	284,082		26	284,097	D27—	42	284,113		24	284,130

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